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AUSTIN GALLAGHER, Secretary.

THE GREAT COMSTOCK CONSOLIDATION.

A prediction made many months ago in these columns seems to be on the point of fulfillment. It is announced that the Consolidated Virginia, California, Ophir, Best & Belcher, Gould & Curry, Mexican, Savage, and some other Comstock mines, are to be united in one mammoth corporation, and it is suggestively added, "with the view of creating a market on the Atlantic as well as the Pacific Coast."

It is almost universally believed by those outsiders who have opportunity for obtaining knowledge of the "bonanza mines," that the great ore chimney, which for several years has produced the marvelous profits with which every man, woman, and child in this country is familiar, is near its exhaustion. Of course, the managers of the companies, the ring which has stock to sell, will not openly admit any thing of the kind, but we believe, nevertheless, the facts justify the general belief referred to. It has long been expected that when the exhaustion of the bonanza was near at hand, a great effort would be made to unload the stock on the Eastern and the English public. That time seems to have arrived, and the effort assumes a more systematic form, though for some time past a very large interest in the Consolidated Virginia and California mines has been held in the East. Should this combination be effected, it would shortly be followed by a cessation of dividends, for the profits of the good mines would be absorbed in keeping the others open.

The California speculators, recognizing the fact months ago that the limits of the great pocket had been reached in the Consolidated Virginia, commenced a series of "bear" attacks on the stocks of the whole list of mines, and though from time to time the "bulls" got the best of them, the general movement has been down, down, down, till now they consider these stocks so low as to leave no margin for a heavy operation, and they are consequently turning their attention to other fields—the Black Hills, Colorado, and Montana—where they have purchased or are negotiating for the largest and most valuable mines. These new mines are intended to take the place of those on the Comstock, and supply the craving for stock speculation or gambling which has taken possession of the people of the Pacific Coast.

Since the two bonanza mines have alone kept up the reputation of the Comstock for some years past, and enabled the great majority of the other mines to collect the assessments which they make with unfailing regularity, it becomes a question of great interest whether, after the stoppage of dividends—which time has almost arrived for the Consolidated Virginia, and will follow in due course to the other companies—the other mines will be able to collect their assessments, and if not, what will become of them? No doubt there will be a very heavy decline in these stocks till the majority of them will have a merely nominal value, and with the drying up of this great source of income, it is reasonable to suppose an astonishing reduction in managing expenses will be found practicable, and even the miners' union will have to give way and wages come to a level with those paid in other districts. These remarks portray, we believe, not the immediate, but still the not very distant future, and it will be well for prudent investors in the East to consider, and perhaps be guided by the acts—not the words—of the shrewd and more experienced California operators, who are unloading Comstocks and buying Colorado Montana, and Dakota mines.

THE INSTITUTE MEETING.

CHATTANOOGA, May 26, 1878.

The meeting has been very successful socially and professionally, in every respect but one, namely, the members have been so much occupied with excursions that little time has been given for the work of the reading and discussion of papers. Most of the papers have been read by title only, the following being the exceptions:

T. STERRY HUNT, "On the Brown Hematite Ore Deposits of the Great Valley;" W. E. C. COXE, "On an Experiment with the Wheeler Process of 'Iron-clad' Steel;" R. W. RAYMOND, "On the Jenks Corundum Mine, N. C.;" J. A. CHURCH. "On the Heat in the Comstock Mines;" J. E. SWEET, "On a New Steam-Engine Indicator;" W. P. BLAKE, "On Zircons in the Magnetites of the Unaka Mountains;" J. A. HERRICK, "Improvements in the Appliance for Venting Molten Steel or Iron from a Casting-Ladle or Shoe."

The papers read by title were the following:

J. A. CHURCH—"The Mode of Combustion in Blast-Furnace Hearths."
P. BARNES—"Memorandum relating to the Construction Account of the Rail Mill of the Edgar Thomson Steel Co., Pittsburg, 1874-5."
C. CONSTABLE—"Blast-Furnace Experience at Rockwood, Tenn."
R. NEILSON CLARK—"The Humboldt-Pocahontas Vein, Rosita, Col."
T. EGLESTON—"Thin Sheets of Metal."
H. FIRMSTONE—"Note on a Deposit of Cadmia in a Coke Furnace."

The following persons were elected as members and associates:

MEMBERS.

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The following persons were elected to office, according to the report of the scrutineers:

President—ECKLEY B. COXE, Drifton, Pa.; *Vice-Presidents*—J. F. BLANDY, Mechanicsville, N. J., WILLIAM METCALF, Pittsburg, Pa., R. H. THURSTON, Hoboken, N. J.; *Managers*—GEORGE ASMUS, New York City, B. W. FRAZIER, Bethlehem, Pa., WILLIAM B. POTTER, St. Louis, Mo.; *Treasurer*—THEODORE D. RAND, Philadelphia, Pa.; *Secretary*—THOMAS M. DROWN, Easton, Pa.

[The above unfinished letter is the latest received from Mr. RAYMOND, except the news of his arrival, seriously ill, at his home in Brooklyn, where he now lies, very weak, but improving daily. We trust our readers will not have long to wait for his account of the excursions of the Chattanooga meeting.]

A PREVENTIVE FOR MINING LITIGATION.

Even the most limited acquaintance with mining matters is sufficient to convince any one that litigation is probably the most fruitful cause of loss in vein mining. It seems, indeed, as if it were almost impossible for any profitable gold or silver mine to escape the blight of a lawsuit, and certainly no greater blessing could be brought to mining interests generally

than the enactment of a law that would make it impossible to misinterpret the limits of mining claims. The questions, "What is a vein?" "What are the limits of mining claims?" are at the bottom of the lawsuits which have ruined so many good mines.

The first of these questions has been so enlarged by the Eureka-Richmond decision that an equally perplexing question is now likely to arise in the form of "What is not a vein?" And, no doubt, efforts will be made to show that any mineral-bearing belt may be thus classed. What the limits of a lode are will probably become more and more obscure as our knowledge of the ramifications of the ore becomes more and more perfect, until, in a system of fissures such as those in the vicinity of Central Colorado, where the ore is disseminated in the altered country rock, it will be impossible to determine which location should hold a number of intersecting veins.

We believe it is absolutely impossible to so define the meaning of the term "lode" or "vein" as to prevent these endless litigations, and even the rights which are acquired by a patent are very uncertain by reason of our ignorance at times of what constitutes the outcrop or "apex" of a vein. With the experience of countless lawsuits before us, it seems almost incredible that laws which make such a state of things possible should not have been changed long ago, and especially when the remedy is so simple and so apparent as it is.

Had our laws been based on the old Spanish mining code, with such modifications only as were necessary from the fact that under the Spanish law all minerals belong to the crown, no conflict in titles could possibly have occurred. There seems in fact no way of preventing conflicts of this kind, except by making the boundaries of a claim the limits in every direction to which a mineral deposit may be followed. It will necessarily follow from this that the area taken up must be larger than at present. We would suggest 1500×900 feet (500×300 meters) as a sufficient area. The corners should be marked with permanent stone monuments, and the patentee would be entitled to all the minerals found within the lines, to any depth, but could not follow them beyond the same limits. He should be obliged to do a certain amount of *bona-fide* work on his claim every year or every six months, in default of which his rights would cease, and any one else could reënter the claim. The anomaly of local laws and customs in every district should be abolished, and this one simple and comprehensive law govern in all cases. Of course, it would be impossible to change established locations, but claims located subsequent to the passage of the law, and especially all new mining districts, should be governed by it. It would be impossible to have any conflict of title, and this most fruitful source of misfortune in mining enterprises would cease. It would then be of no consequence what meaning should be applied to the term vein or lode, nor would the difficult problem of which lode holds, at intersections and unions of veins, the united vein, any longer trouble anxious mine owners. The problem would be as simple as determining the ownership of a town lot, and the change, though it might be objected to by the lawyers, would be a blessing to miners and mine owners.

COLORADO AS A FIELD FOR EMIGRATION.

We are so frequently asked for advice upon the question of emigrating to Colorado, that probably the simplest and most generally useful way of giving it will be through the columns of the JOURNAL.

Colorado is to-day the most prosperous State in the Union; and it naturally loses none of its attractiveness by its distance from the homes of those who think of going there. Yet as "all is not gold that glistens,' so will Colorado not fulfill the golden expectations of many who go there.

Colorado, like all newly-settled countries, is a home for workingmen. The man who goes there with the intention of working in the mines finds ready employment at exceedingly good wages, from $2 to $2.50 a day being the usual rate of wages in the mining districts.

More ambitious men can take contracts for driving drifts or sinking shafts in the mines, or prospect on their own account. There are numberless shafts and drifts not worked, but in which a man can make wages, and in which he can work out a few cords of ore without objection on the part of the owners. In a word, any man able and willing to work can make good wages. It is far different with professional men and others seeking employment. There is little or nothing for them to do. If they have means, no doubt they can find many excellent opportunities to invest in mines, and they not unfrequently make large fortunes; but a young man who goes to Colorado with the expectation of obtaining a clerkship, employment as a civil or mining engineer, or even as an assayer or surveyor, is more than likely to meet with disappointment. Our miners who are earning 80 cents to $1 a day in New Jersey, and who, on account of short time, do little better in the anthracite regions of Pennsylvania, would gain by going to Colorado; but it is rock men who most readily find employment, the coal mining of the State being, as yet, but slightly developed. There are also several railroads building, and laborers are paid on them two dollars a day. During the summer months, there are plenty of gulches where wages—and sometimes fortunes—can be made, washing for gold; so that no man who is not afraid of hard, manual labor can fail to make a living, and generally he can make handsome wages.

The climate is excellent, though the winter in some parts of the State is somewhat rigorous.

IMPORTANT COAL AND IRON DEVELOPMENTS IN OHIO.

We have been favored by the politeness of Prof. E. B. ANDREWS, of the State Geological Survey of Ohio, with a copy of a lately published report of geological investigations along the line of the Cleveland, Canton, Coshocton, and Straitsville Railway, which, from the interesting nature of the new and valuable discoveries recorded therein, has an importance beyond the interests of the company to which it was made.

In a letter accompanying the report, Prof. ANDREWS makes the following reference to the subject: "You will, by it, see that I have found some coal of rare heating and evaporative value; also very large deposits of black band ore of excellent quality; the latter in a new geological horizon."

The following extracts from the report will give a general idea of the industrial importance of the mineral wealth which the new road will develop:

"In addition to the black band ores over coal seam No. 5, there are, in the vicinity of your railway, deposits of black band in the well-known horizon over coal No. 7. In vertical distance these two ore horizons are a little more than one hundred feet apart. In the hills east of Rogersville are the famous Wilhelmi and Burton mines, from which large quantities of black band ore have been taken. On the Burton hill the ore has a reported maximum thickness of 7 feet, and an average thickness of, perhaps, 3½ to 4 feet. On the opposite hill is the Wilhelmi mine. A measurement made by myself in the mine near the spot from which the fine block sent to the Centennial Exposition at Philadelphia was taken showed the ore to be 5 feet 6 inches thick. With the black band there is sometimes a plate of calcareous ore, called 'mountain ore.' The black band ores in this region are of excellent quality, but in very limited areas. The Wilhelmi bank is about midway between the Marietta, Pittsburg, and Cleveland Railway and your road. No bodies of this ore have been opened between the Wilhelmi bank and your road, but I think I saw at some points unmistakable indications of decayed black band along lines of outcrop. All this ore could be made tributary to your line.

"The wide extent of coal seam No. 6, on both sides of the road in Sugar Creek valley, combined with the remarkable quality of the coal in heating and evaporating power, constitutes an economic feature of the line which can not be overestimated. The coal is everywhere above valley drainage, and is accessible by adits in the hillsides to be opened at trifling cost.

"The largest exhibition of coal on your line is to be found at its probable terminus at Buckingham, in the Upper Sunday Creek valley, in Perry County. This is in the extreme northeastern point of the well-known Hocking Valley coal field, and also the point nearest to Cleveland. Here are several thousands of acres of the Nelsonville or Straitsville coal seam, ranging from 10 to 13 feet in thickness, easily commanded by your proposed road. Nowhere in the whole field is the coal so thick, and nowhere, in my opinion, is its average quality so good. This coal of Upper Sunday Creek is destined to play a most conspicuous part in the future development of the great coal and iron industries of Ohio.

"For iron ores I regard your road as peculiarly fortunate. I was prepared to expect, in the high hills lying east of your line, in the Upper Sugar Creek valley, valuable deposits, in limited areas, of the black band ores over coal seam No. 7; but when, in March last, on my first visit to this valley, I was able to authenticate vast bodies of black band ore over coal seam No. 5—a horizon more than one hundred feet lower—I was both surprised and delighted.

"This ore is most conveniently situated for working and transfer to the railroad."

A supplement to the report contains the following:

"Since the foregoing was prepared, very considerable bodies of iron ore have been found in the neighborhood of Moxahala, near your proposed line of road, and only a short distance from where the great seam of coal appears on Upper Sunday Creek. The ore is believed to be in the same horizon with the Iron Point ore, at Shawnee, now used by four blast furnaces. It is upon these more recently discovered ores that the furnace at Moxahala is now successfully running. The geological position of this ore probably corresponds to that of the Tuscarawas black band over Coal No. 7. In some places the ore assumes a laminated structure, and contains a small percentage of bituminous matter, and is often called a black band. The ore is sometimes thoroughly oxidized, and yields in some analyses more than 50 per cent of metallic iron. Much ore is known to exist in the hills between Buckingham and Moxahala, but as yet no very careful investigations have been made of them."

Referring to analytical results of his examinations of these coals, Prof. ANDREWS has stated certain of them show a calorific power not only greater than that of the other famous coals, but greater than that of charcoal which is taken as the standard, and in evaporating power they are equally remarkable. While 1 pound of charcoal will evaporate 15 pounds of water from 212°, two of the newly examined coals evaporate respectively 15·1 and 15·2 pounds, and of the other four investigated, all three evaporate more than 14 pounds, and the fourth converts 13·9 pounds of water into steam.

The coal which heretofore gave the highest results is the famous Youghiogheny coal of Pennsylvania, a standard coal, and one of the very best bituminous coals of the world. The Youghiogheny coal evaporates but 14·8 pounds. Two of the newly studied coals therefore, according to Prof. ANDREWS, surpass this standard coal in each of the particulars

dwelt upon. They have the objection, however, of containing more sulphur (they average 1·412 per cent) than the standard coals with which they are compared—but not enough, Prof. ANDREWS thinks, to compromise them, except possibly in the blast furnace, and even there, he thinks, with proper management it will do little harm. He makes a pointed reference to the well-known fact that the distribution of sulphur in coals is extremely unequal, implying that this will also be the case with these beds, and remarks that almost every furnace using bituminous coal oftentimes uses coal having a larger percentage of sulphur than these contain. The "black band ores" observed were also, as above noticed, of exceptionally good quality, average samples of calcined ore showing an average of 40·51 per cent of metallic iron, and an average of 0·030 per cent of phosphorus.

NEW PUBLICATIONS.

WORK DONE BY AND POWER REQUIRED FOR FIRE STREAMS, *together with valuable Tables and Information relating to Hydraulics.* By GEORGE A. ELLIS, Civil Engineer. Clark W. Bryan & Co., Publishers, Springfield, Mass. Crown 8vo, pp. 182. *The Scientific Publishing Co.*, New York, Agents. Price in muslin, $1.50; morocco, $1.75.

This little work, neatly published in pocket-book form, contains material of interest not merely to those operating water works and fire departments in large cities, as indicated by its title. All persons unfamiliar with mathematics, and yet needing to make calculations in hydraulics, will find its concise statements of theory, and remarkably compact tables, very useful. To those interested in hydraulic mining of placers, the careful tables contained in this little book will prove of value in saving labor and calculation. Table 1 gives the theoretical discharge from circular orifices or nozzles from $\frac{1}{16}$ to $2\frac{1}{2}$ inches diameter, with a head varying from 10 to 130 feet, and a velocity per second from 38·58 to 139·08 feet. Table 3 gives the theoretical and actual discharges of given nozzles side by side. Table 4 is a table of United States gallons, corresponding to the contents of one foot in length of given pipes. Tables 5 and 6, the friction losses in pounds in clean iron pipes, and hose of given diameters for every 100 feet in length. The remaining tables, twenty in number, are various details of work done by streams issuing through different nozzles and hose. The tables seem to be carefully worked out, and are based on experiments made by Chief Engineer A. P. LESHURE, of the Springfield Fire Department. They are connected by concise explanations of the principles of hydraulics involved, stated in clear language. The design of the work is most excellent, and its form is all that can be desired. We commend the little book to all those having need of tables of this description.

J. C. F. R.

CORRESPONDENCE.

EDITORS ENGINEERING AND MINING JOURNAL: *Sirs:* Your Western correspondent who contributes "Mining News" to your JOURNAL, is so generally correct that I like to catch him when I can. In your number of date May 11th, he says: "The *late* Prof. Sheppard, the great perambulator of Missouri, is said to have first discovered the silver mine in Madison County." Now, I wish to assure your correspondent, yourselves and your many readers that "late," of all others, is the wrong adjective to apply to Prof. Forrest Shepherd. He never was *late* in his life. But perhaps "B." means by it that the Professor is dead. If he will look around old Norwich or Collinsville, Conn., he will find him one of the livest men in those parts. The ancient Greeks gave as the best of wishes to their friends the prayer that "late might they return to heaven." So will all the multitude of friends of Prof. Shepherd pray that, for the first time, he may be "late" in his departure from a world he has done so much to explore.

N. W. B.

KINGSTON FURNACE, Mo., May 23, 1878.

SOUTHERN COLORADO COAL AND COKE.

The Southern Colorado Colliery and Coke Works, under the superintendency of GEORGE U. ENGLE, member of the Institute of Mining Engineers, are now producing about two thousand tons of coal per month from their mine in the foot-hills of the Raton range of mountains, a few miles south of the town of El Moro. Of this output Professor HILL is using three cars per week, the Denver Gas Company one car daily, the Denver and Rio Grande Railway two cars daily, and the Pueblo Iron Company from two to three cars daily. Several cars per month are also shipped for domestic and other purposes. A shipment of about one hundred tons of screenings is made during the month to the blacksmiths of Colorado and Kansas, and the balance of about seven hundred tons, mostly screenings, is used at the fourteen coke ovens belonging to the same company. The coke ovens are producing three hundred and seventy-five tons of coke per month. Regular shipments are made *via* Cañon City and Colorado Springs to Harrison's Reduction Works at Leadville, the Golden Smelting Works at Golden, and to J. H. BOYD, of Boulder. Several hundred tons have also been shipped for trial to L. E. HOLDEN, proprietor of the Old Telegraph mine, and to the Utah Forwarding Company, both of Salt Lake, and to the Richmond Mining Company, of Eureka, Nevada.

The tests which have been made of this coke have been so satisfactory that one half of the ovens are now running exclusively on Utah orders, while additional contracts are being negotiated with other parties in the same territory. The company will shortly erect more ovens to supply this rapidly increasing trade, as the present orders exceed the output of the ovens, and are being supplied partly from the best of the surplus which accumulated before the Utah trade was developed. As regards the merits of this coke, it is sufficient for the present to say that it has met the widely-known Connellsville coke in Colorado and has taken its place; it meets the same coke in Utah and Nevada, and is successfully competing with it.

THE LOWE PROCESS AT BALTIMORE—A GENUINE COMPETITION IN GAS-LIGHTING.

The complete success of this system in a city of 350,000 population, marks an era not only in its own progress, but in the history of gas-lighting as well. This will be the better appreciated if what it has accomplished be stated briefly. A few months ago Baltimore was lighted by a monopoly, and very poorly lighted at that; for the statute required only 12-candle power, and the companies naturally under such circumstances are not apt to break the law by excess. The price charged for this low quality was $3 per thousand. Consumers were charged a round price and profit upon connection pipes and compelled to pay a deposit on meters which was greater than their cost, and which furnished a large cash capital for the company's operations. The new organization ("The Consumers' Mutual") came forward, promising to build works, lay mains, put in services and meters free of cost to the citizens and furnish a superior gas at $2. The people promised to support it.

In January last, the new works began operations, and have since regularly distributed a 22-candle gas. The old interest has raised its standard to 18 candles. The new company already supplies about 5000 buildings and receives a handsome daily average of new subscriptions. Immediately on its starting the old company reduced its price to $1.50 per thousand, hoping thereby to hold its customers and compel its rival to make further concessions. In both objects, however, it failed, for the new company held to its original charge with the result already mentioned and in spite of the temptation to save the extra 50 cents for these hard times, the people are steadily increasing their patronage.

The result to the city of Baltimore is, that it is now one of the best lighted cities in the United States, getting from 50 per cent to 75 per cent more light for 30 per cent to 50 per cent less money. The actual cash saved to consumers amounts to $2500 per day, without reckoning the economy growing out of the improved quality. The old company states that although deprived of so many consumers, it is still selling as much gas as formerly, which, if true, is a gratifying evidence of the fact often insisted on by us, that a reduction of price would largely stimulate consumption. We understand that the new company is entirely satisfied with the ability of the Lowe process to compete in every particular of quality and cost with the old method of distillation in retorts.

The 8 generators which were guaranteed to produce 500,000 cubic feet daily, without forcing, yield 6000 each per hour, or over a million feet for the 24 hours. The cost in holder is below the sum promised, as the quality is considerably above, being uniformly maintained at 22 candles. The cost of distribution is much less than in the case of coal-gas, because there is little if any loss in transit by condensation. The drips show an insignificant accumulation, while photometric tests four miles distant from the works betray no appreciable change of illuminating power.

An eminent expert who has recently made analyses there reports that the most delicate methods failed "to detect the faintest trace of carbonic acid, sulphur, or ammonia," and pronounces it to be the purest gas that has ever come under his observation.

On this aggregation of facts, we think the Lowe process has fully demonstrated the entire success of the water-gas principle, and is entitled to take permanent rank among the beneficent arts of civilization. There are other systems which utilize the hydrogen of steam and make good light, but they do not appear to show a genuine competitive energy, and therefore we specify the Lowe process. This began its operations some five years ago, with a distinctly avowed purpose of improving the quality and cheapening the price of gas-light, and this pledge it has handsomely kept. It has had to grapple with ignorance, conservatism, prejudice, political influence, and strong vested interests; but, despite them all, it has gone straight on, and is to-day in successful operation in a score of towns and cities, in every instance raising the candle-power and permanently reducing the price of gas.

Some of the shrewder of the old companies are concluding that it is only a question of time with the antiquated retort system, and are adopting the new one. If they will take one more and seemingly easy step, and send out a cheap fuel gas, such as Dr. MOORE'S recent report upon the Strong process proves they can do, they will deserve and surely receive an enthusiastic and profitable patronage.

PURIFICATION OF PHOSPHORIC CAST-IRON.

To the Secretary of the American Iron and Steel Association:

SIR: A cheap and effectual method of wholly eliminating phosphorus from molten cast-iron is the important problem which has exercised iron and steel manufacturers ever since the great invention of Mr. BESSEMER, supplemented by my lesser but indispensable process of adding to Mr. BESSEMER'S decarbonized molten cast-iron a metallic compound of iron, carbon, and manganese, commonly called spiegeleisen, or ferromanganese, has enabled railway companies to lay down steel rails and engineers to supply themselves with cheap steel, such steel being now made and sold at a lower price than the average cost per ton of wrought-iron for these purposes during the last fifty years.

From the nature, however, of the Bessemer process, which leaves the phosphorus in the cast-iron practically intact, only such pig-irons as are nearly free from phosphorus have been available for this process of steel manufacture. By far the largest class of British pig-iron is wholly excluded from being thus utilized, owing to the notable quantity of phosphorus with which it is contaminated. The Cleveland pig-iron, the cheapest in the kingdom, has been thus excluded. Mr. I. LOWTHIAN BELL has laboriously investigated the properties of Cleveland pig, and has shown that the well-known action of cinder in washing phosphorus out of phosphoric pig-iron can be applied successfully at a certain cost to the preparing of that pig-iron, without much loss of carbon, so as to adapt it for the Bessemer process. Unfortunately, however, the extreme competition in steel manufacture renders a process which entails extra expense inadmissible. Mr. BELL, therefore, can not, I think, hope to see his

process adopted; at all events, not with steel rails selling at £6 10s. per ton.

It has been reserved for Mr. GEORGE I. SNELUS, of Workington, to solve this great metallurgical problem successfully. Lime has played a most important part in iron metallurgy, hitherto, as an indispensable ingredient in the burden of the blast-furnace. Lime will now, thanks to Mr. SNELUS, be found indispensable to the practical and economic success of the Bessemer process when applied to phosphoric pig or cast-iron. But the invention of Mr. SNELUS will, in my opinion, effect even more than this. It points, indeed, to the manufacture of soft steel, possessing all the peculiar excellencies of wrought-iron without any of its defects, and the puddling furnace may thus, with all its manifold imperfections, become a thing of the past. Seriously I believe that this invention of Mr. SNELUS will cause Mr. BESSEMER, Dr. SIEMENS, and myself to hide our diminished heads, though, by the way, mine has been already pretty well hid and diminished, owing to the golden shower, which in the world means fame, not having extended my way.

It would be difficult to overestimate the value and importance of Mr. SNELUS' sinvention, assuming, of course, that the requisite mechanical details can be practically and economically carried out; and I myself see no reason for doubting this. I congratulate Mr. SNELUS heartily. Combining a practical knowledge of chemistry with an equally practical knowledge of iron and steel metallurgy, he is the right man in the right place. Very truly yours, R. F. MUSHET.

CHELTENHAM, ENGLAND, April 15, 1878.

THE IMPORTS AND EXPORTS OF THE UNITED STATES.

We give below a statement taken from the report of the United States Bureau of Statistics, showing the movements of the various articles of commerce into and from the United States for the month ending with the 31st of March of the present year, and for the previous nine months ending with the same period. A comparison is appended, showing the course of the same articles for the like periods of 1877. A glance at the figures herewith presented reveals a very satisfactory condition of our foreign trade. It will be observed that while the aggregate of our imports for the periods given exhibits but a difference of about $5,000,000 in favor of the present year, the exports for the same periods aggregate a difference of nearly $60,000,000 in favor of 1878. The grand totals of exports of all commodities, exclusive of coin and bullion, for the first nine months of the present fiscal year, ending with the 31st of March, were $536,563,772, against $495,949,540 for the same period in 1877:

IMPORTS.

COMMODITIES.	VALUES. Month ending March 31st.		Nine months ending March 31st.	
	1878.	1877.	1878.	1877.
	$	$	$	$
Sulphur or brimstone, crude, f. o. d.	54,451	309,063	957,346	870,389
Tin in bars, blocks, and pigs, f. o. d.	253,188	115,412	1,862,625	1,244,254
Brass, and manufactures of	21,066	20,322	202,713	177,372
Coal, bituminous	113,219	58,848	1,495,358	1,485,827
Copper, and manufactures of	26,725	59,742	293,702	390,540
Iron and steel, " "	619,193	705,709	7,089,344	7,232,291
Lead, and " "	4,252	8,612	334,934	450,553
Salt	115,712	113,904	1,248,746	1,246,062
Saltpeter (nitrate of potash)	27,176	131,261	220,548	341,978
Sulphur, refined	525	...	12,896	36,039
Tin, and manufactures of	785,432	901,007	7,587,131	6,768,909
Zinc, spelter, and manufactures of	6,713	10,577	103,959	109,964
Total value of all dutiable commodities imported	26,317,496	32,675,670	220,605,154	215,879,571
Total value of all commodities free of duty imported	13,379,524	18,429,191	129,156,790	136,376,987

EXPORTS.

Brass, and manufactures of	11,947	12,015	257,467	128,522
Coal, bituminous	40,499	52,753	662,499	670,272
" other	25,187	21,871	978,415	1,363,324
Copper, and manufactures of	157,856	249,024	1,711,927	2,467,652
Iron and steel, and manufactures of	1,260,849	600,073	8,030,269	5,929,758
Steel, and manufactures of	209,166	187,812	2,027,937	5,073,322
Lead, " " "	57,192	1,196	119,385	40,736
Quicksilver	49,746	135,090	888,573	1,304,266
Salt	1,968	1,829	17,439	14,938
Tin, and manufactures of	7,816	3,866	68,652	44,944
Zinc, " " "	26,868	8,670	218,076	73,905
Total value of merchandise of all kinds exported exclusive of coin and bullion	71,155	46,983,199	536,563,772	495,949,540

MINERAL RESOURCES OF ATACAMA.

Since the days when the adventurers of the fifteenth century first opened up the continent of South America, it has never ceased to be associated with dreams of easily acquired riches. At first supposed to be a veritable El Dorado, where gold could be had for the mere trouble of picking it up, it has later been quite as much a delusion to bondholders and concessionists as Turkey itself. Hence the public mind is in a perfectly judicial, if not incredulous, mood as to reports of the immense fortunes to be still made by properly conducted enterprise in South America, and consequently no better task could be performed by any of the numerous governments in that part of the world than that of a systematic and honest investigation of their natural resources. This appears to have recently been done by the Chilian Government, so far as regards the district or desert of Atacama, on the extreme north of its domains, and from the report of the commissioners we now propose to quote a few particulars.

Cubic niter, guano, silver and copper are the chief products of northern Chili, and it must be admitted that these are all highly valuable. Many attempts have been made to bring them into commerce, but the natural difficulties of the country have been too great. The land is barren; supplies of potable water are frequently unattainable; the coast range of the Cordilleras cuts it off from the sea; roads are scarce, and carriage is expensive. To improve these conditions was the object of the commission just mentioned, which comprised both engineers and geologists, and its first outcome is the promulgation of a decree, establishing two new ports, Blanca Encalado and Taltal, nearly in the meridian of Santiago, and about 45 and 110 miles respectively south of Antofagasta. Roads running into the interior have also been planned, and it is intended to proceed with their construction as soon as possible.

The portion of the report which will chiefly interest our readers is that contributed by M. A. PISSIS, on the geology and mineralogy of this region. He describes the desert of Atacama as consisting practically of four basins, wherein may still be seen the dry channels of the ancient rivers which once irrigated these extensive regions. The face of the country consists of hills of rounded forms and gentle slopes. From these jut numerous spurs, running nearly north and south, and subdividing the large basins into plains of lesser magnitude, some of which are inclosed on all sides, and have, apparently, been the sites of ancient and extensive lakes. The elevation of these plains increases as they approach the Andes, the eastern boundary of the desert. The average rise is 1 in 44, and the disposition of the land is stated to be very favorable for the construction of railways, the more so as the soil is mostly alluvial.

The niter deposits are found dispersed in the central part of the desert, from 26° 30′ to nearly 24° south latitude. Six or eight of them are worked, and perhaps some account of the Callega Company's working will suffice to give an idea of their general character. The plain, bounded by hills and mountains, in which this is situate, appears to be the bed of an old lake. Its center is occupied by a thin bed of niter, which, however, increases in volume as it approaches the high ground. On the north side numerous trial pits have been sunk, exposing sections of the niter-bed, varying from 3 feet to 8 feet in thickness. The mineral is compact and yellowish, containing notable quantities of salt and sulphate of soda; the average of the assays for niter being from 23 to 30 per cent. The sub-stratum is rather hard gypseous conglomerate. The nitrification of the decomposed feldspar with which the face of the country is covered is a process continually going on, and hence any calculation as to the possible duration of these deposits is hardly likely to be correct. The concessions of a single company are, however, reckoned to produce a million quintals annually, and to be capable of working forty-eight years before exhaustion. Mr. PISSIS is therefore apparently very moderate in his estimate of "more than a century" as the probable duration of the Atacama niter-beds. The average yield of refined niter from the raw mineral may be gathered from the following percentages of the salt in various localities: Aguas Blancas, 13; Pampa de Lavanderos, 37; Baron, 27; La Descubridora (Bañados), 42; Cachiyuyal, 6; the Third Pampa, 13; Aguilar, 15; Aguas Blancas (Peña), 6. More detailed analyses are given in the table below:

LOCALITY.	Aguas Blancas.		Pampa de Lavanderos.		Baron.	Second Pampa of Guzman Company	Second Pampa of Cachinal.	Atacama (analyzed by Domeyko).	
Nitrate of soda	14	5	35	17	27	12	32	27·98	24·30
Sulphate of soda	51	68	11	6	3·5	9	10	8·46	4·95
Sulphate of lime	...	...	...	...	...	9	6	3·41	...
Sulphate of alumina	3	6	1·5	2	2·5	8	...	...	...
Sulphate of magnesia	..	...	...	3	...	...	...	...	...
Magnesia	...	...	...	...	...	traces	...	traces	traces.
Lime	...	...	...	...	...	...	...	...	
Chloride of sodium	22	9	2·5	6	18	6	22	23·00	53·65
Iodine	...	...	...	...	trace	...	...	...	...
Insoluble substances	9	9	51	64	47	53	23	14·70	9·80
Water	...	1	...	...	...	1	2	22·45	7·30

Guano is another important product, usually occurring in close contiguity to niter-beds, and so close to the surface that it is often laid bare by the horses' hoofs in riding over the ground. It appears to be rich in organic matters, one sample examined by M. DOMEYKO only containing 15 per cent of non-volatile residue, while it gave 12 per cent of nitrogen, and 4·3 per cent of phosphoric acid, the main part as a soluble salt. Mr. PISSIS found a specimen containing borate of ammonia. Another product which is calculated to become of importance is the borate of soda and lime, or ulexite. Only two deposits are known at present, viz., in the lagoon of Maricunga and near that of La Ola. But, boric acid being a volcanic product, it is highly probable that other beds of its compounds will be found near the volcanoes of the Cordilleras.

Ores of copper and silver, as well as argentiferous galena, are also found in abundance. The localities of five silver and fifteen copper mines actually at work are marked on the map which accompanies the report from which we are quoting, while the commissioners say that there is scarcely any portion of the coast-range, from the 27th parallel to the Chilian frontier, which does not contain some mineral veins. At the foot of the Andes are also found variegated copper ore, gray sulphides, and ruby ore, while on the western slopes of the same range are found many ores of silver.—*Iron.*

MAGNETIZATION OF NICKEL.—Some researches on the magnetic properties of nickel were recently made by the well-known physicist, M. H. Wild, and are published in the *Bulletin* of the Imperial Academy of Sciences of St. Petersburg. M. Wild arrives at the following conclusions: (1) Pure nickel can become permanently magnetic to a considerable degree, thus differing materially from pure (soft) iron. The maximum quantity of permanent magnetism which pure nickel can retain is, however, only between one half and one third of that quantity which hard steel can permanently retain. (2) Magnetism is less permanent in nickel than in well-hardened steel after the magnetizing force has ceased to act; the slow loss of magnetism in course of time, as well as by heating and cooling, is comparatively greater in nickel than in steel; and this is the case even if the nickel has, like hard steel, by repeated heating and cooling, been brought to a certain state of permanent capacity. (3) The temperature coefficient of nickel magnets in the latter state is a little larger than that of properly hardened steel. (4) The temporary magnetism which pure nickel can retain is about double its permanent quantity, or about one half of the temporary magnetism which hard steel, and about one quarter of that which soft iron can retain. In its magnetic properties nickel is, therefore, very inferior to iron and steel.

MODERN EXPLOSIVES.*

[*Continued from page* 362.]

DISCUSSION OF THE DIFFERENT EXPLOSIVE REAGENTS.

With regard to the comparative characteristics of the different explosives, it would be rash to lay down any empirical rules as to the one being better or worse than the other.

The question must vary with the character of the material used and with the position in the material (whether heading or bottom) in which the explosive is to be applied.

We have seen, in the discussion of the three principal explosive compounds, what their calculated power is. It may now be well to present these figures in direct contrast:

	Powder.	Nitro-glycerine.	Gun-cotton.
Mixture of gases in cubic centimeters at 32° F. (0° C.) produced by 1 gram of the explosive	200	2,000	1,200
Temperature of these gases in degrees centigrade	3,300	5,200	4,500
Theoretical maximum pressure in atmospheres (1 kilogram to a square centimeter)	4,300	26,000	15,300
Theoretical maximum power per kilogram of explosive in kilogrammetres	42,000	400,000	200,000
Theoretical maximum power per kilogram of explosive in foot-pounds	303,786	2,893,200	1,446,600

Now, from this, it would appear that the theoretical maximum pressure of nitro-glycerine is six times, but the theoretical maximum power ten times that of gunpowder. BERTHELOT has calculated the quantity of heat generated in the explosive reaction of different bodies, and the volume of gas formed—the product of these numbers giving a term of comparison between the pressure that, as he conceives, "accords in general with experience."

EXPLOSIVE SUBSTANCES.	Quantity of heat evolved per kilo.	Volume of gas formed.	Product of the two preceding numbers.
	Cal.	M. c.	
Blasting powder	510,000	0·173	88,000
Chloride of nitrogen	316,000	0·370	117,000
Artillery powder	608,000	0·225	137,000
Sporting powder	641,000	0·216	139,000
Nitrate of soda powder	764,000	0·248	190,000
Picrate of potash and saltpeter	852,000	0·337	286,000
Chlorate of potash powder	972,000	0·318	309,000
Picrate of potash	578,000	0·585	337,000
Picric acid and saltpeter	923,000	0·408	376,000
Gun-cotton	590,000	0·801	472,000
Picrate of potash and chlorate of potash	1,422,000	0·337	478,000
Nitrated gun-cotton	989,000	0·484	480,000
Picric acid	687,000	0·780	536,000
Picric acid and chlorate of potash	1,424,000	0·408	582,000
Chlorated gun-cotton	1,420,000	0·484	680,000
Nitro-glycerine	1,320,000	0·710	939,000

These figures are given both by Trauzl and Schoen.

By this table, it would appear that, theoretically, sporting powder, though giving out more heat than either blasting or cannon powder, is still not much stronger. Again, blasting powder is one of the lowest of explosives. The ratio of gun-cotton to blasting powder is, theoretically, over 5 to 1, and that of pure nitro-glycerine over 10 to 1. These proportions, however, are considered practically as too high. SARRAU, in some more recent experiments, has taken the ground that the force of any explosive substance is nearly proportional to the product of the heat of combustion, by the weight of the permanent gas produced by the combustion, and has, from experiments, prepared the following table:

Name of Substance.	Relative Force.
Saltpeter powder	1
Chloride of nitrogen	1·08
Mixture of 55 parts picrate of potash and 45 parts saltpeter	1·49
Mixture of equal weights of picrate and chlorate of potash	1·82
Picrate of potash	1·98
Gun-cotton	3·06
Nitro-glycerine	4·55

This again would appear practically to be too low a ratio to express, for instance, the relative force of nitro-glycerine and saltpeter powder; the reason is that, under the circumstances in which the higher explosives are now used, their full strength is more completely brought out than that of powder.

This has well been shown in the researches of ROUX and SARRAU on detonation. To their joint researches is chiefly due the light that has been thrown on the possibility of producing two kinds of explosion in the same substances, and they distinguish them as being of the *first* or of the *second* order. An explosion of the first order occurs when the explosive is fired by the application of heat and percussion; an explosion of the second order occurs when the explosive is fired simply by the application of heat, as in applying flame. An explosion of the first order being produced in an explosive by the detonation of a substance having primarily that quality (as fulminate of mercury), may itself be called a "detonation," as contradistinguished from an explosion of the second order, which is what has always been known by the simple term "explosion."

As to the detonating powders proper, SPRENGEL remarks: "It is to be regretted that no exact method exists for comparing the force of detonating explosives." How a detonating substance directly affects a sympathetic detonation in another explosive, not primarily detonable, is not yet determined.

Detonation may be defined to be the instantaneous explosion of the whole mass of a body. Thus, when gunpowder is fired in the usual manner, true combustion takes place, which goes on with comparative slowness from the surfaces of the grains toward their interiors. On the other hand, when nitro-glycerine is fired by means of fulminating mercury, the whole mass explodes simultaneously, or nearly so. Ordinary gunpowder can be detonated if fired with a small amount of nitro-glycerine, which primarily is detonated by a fulminate.

The following table shows the results of ROUX'S and SARRAU'S experiments on the relative force developed by the simple explosion and detonation of the three prominent explosives:

SUBSTANCE EXPLODED.	Simple explosion.	Detonation.	Relative weight of gases.	Heat disengaged by 1 lb.	
				Simple explosion.	Detonation.
Gunpowder	1·00	4·34	0·414	1316	1318
Gun-cotton	3·00	6·46	0·850	1902	1909
Nitro-glycerine	4·80	10·13	0·800	3097	3200

Now, this table shows most emphatically the enormous increase of force gained by detonation over explosions; for ordinary gunpowder is seen to be raised at once to over four times its explosive strength. It must further be remembered that in practice, gun-cotton and nitro-glycerine are detonated in blasting, while black powder is not. Practically, nitro-glycerine may therefore (HILL) be said to be about eight times as powerful as black powder, dynamite (75 per cent nitro-glycerine) six times, and gun-cotton from four to six.

CURTIS and HARVEY have recently produced in England a variety of gunpowder (known as E. S. M.), which, owing to its possessing the quality of quicker ignition, has been found (according to ANDRÉ) to be susceptible of direct detonation, and has, on detonation, developed an enormous increase of force; greater than the relative amount found for gunpowder in ROUX and SARRAU'S experiments, and, in fact, little if at all inferior to dynamite, with a percentage of 75 parts of nitro-glycerine. (This would in a measure explain the force developed by the dope of No. 2 dynamite, if the latter is considered to be detonated.) Now, this discussion leads directly to the conclusion so ably put by ANDRÉ, that the various explosive compounds, according to their work in blasting, can clearly be divided into the two classes of,

1. Slow or rending compounds.
2. Quick or shattering compounds.

A slow or rending compound is therefore distinctively one in which the transformation of the substance into gaseous form is slow, and where the explosive force is exerted by degrees as the gases are developed; and these compounds are the ones in which the greatest effect produced is not invariably at the exact point at which the explosive is located—that is, the gas being slowly evolved, will tend to concentrate its strength and act in the line of least resistance, and the pressure upon the containing body can in no part be greater than that which is exerted on the part which yields—that is, it can never be greater than the resistance on the least resistant part. This class of explosives is, of course, especially applicable in quarries, etc., where the material is required to be blasted in certain shape or in large blocks. Gunpowder is its prominent type.

A quick or shattering compound is one where the transformation of the substance into gas occurs practically instantaneously, and the full force of the enlarged volume is at once exerted in all directions and upon every part of the containing body, because motion requires time, and as no time is allowed for the less resistant part to yield, by moving away before the pressure of the fluid, the whole force of the latter must be exerted upon all alike; the rock is therefore not only blown out in fragments to the full depth of the hole, but is violently strained and shattered in the immediate vicinity of the hole, even where the resistance is greatest; so we see that these shattering explosives are of especial value in tight headings driven through hard rocks. Of this class, nitro-glycerine is the distinctive type.

Between gunpowder and nitro-glycerine as extremes, the other explosives in use range according to their strength; and we must remember, in studying their practical application to blasting, that, in choosing the best explosive for a particular piece of work, and in different parts of the same work, many circumstances must be taken into consideration; whether the material to be blasted is homogeneous in its character, whether it be a hard, soft, or loose rock, and whether time is an essential element in the problem. In the same piece of work, different explosives can generally be used to advantage, in the different workings; as in a tunnel, the heading often requires a quick and the bottom a lifting force. For this reason, it will not do to assume that one explosive is practically better than another, in the ratio in which it may be said to exceed it in power.

ON THE USE OF LOCOMOTIVES UNDERGROUND.*

By C. Heinrich.

The iron-works at Resiczka in the Hungarian Banat draw their supplies of fuel from two seams of coal in the lias at Doman. These are worked by main levels driven from the valley, the principal one being 6800 feet long from the mouth to the sidings in the mine where the trains are made up, in addition to which there is a length of 1470 feet of surface line leading to the coal-screening and washing places. The total length of the double trip with empties in and loaded trucks out of the mine is 3·1 miles, the daily output of coal being estimated at 300 tons. The section is variable, being 9·8 by 9·5 feet for 500 yards from the mouth, then reduced to 8·2 feet high and 6·5 feet broad for the next 440 yards, both sections being in masonry; after which the remaining 1330 yards are in rock and of irregular section, the minimum area being 41·5 square feet. Wrought-iron flange rails weighing 14 lbs. per yard are used; they are laid upon cross sleepers of oak 1·8 feet apart upon a bed of gravel ballast 7·8 inches thick. The gradient of the line is 1 in 21·3 in the underground portion and one in 50 on the surface lines. The gauge is 2 feet 3½ inches. The conditions laid down in the specification for the locomotives were the following:

1. They must push sixty empty trucks, or, when conveying men, thirty trucks, corresponding to a load of 22 tons, up the line, having a gradient of 1 in 21·3, at a speed of 4·34 miles per hour.
2. The cross-section of the engine must not exceed 19·35 square feet in order to leave sufficient air-way for ventilation.
3. They must carry sufficient water to make the trip in and out of the

* Condensed from advance proofs of *A Treatise on Tunneling, Explosive Compounds, and Rock Drills*. By Henry S. Drinker, Mining and Civil Engineer. Published by John Wiley & Sons, New York. (Copy-righted.)

* Abstract of a paper in the *Zeitschrift des Berg- und Hüttenmännischen Vereines für Steiermark und Kärnten*, Vol. ix., p. 238. From the Proceedings of the Institution of Civil Engineers of London, edited by James Forrest, Secretary.

mine without an intermediate watering station, and make as little smoke as possible.

The latter point, that of smoke-consuming, has been met by increasing the steam space of the boiler in such a manner that the requirements of the engine may be met with as little firing as possible, while underground, and the section of the blast pipe is considerably increased. The heating surface adopted is 94·7 square feet per H. P., or more than one and a half times as much as that usually adopted in locomotives. The small height of the chimney and weaker exhaust blast rendering an increased natural draught necessary, the smoke-box tube-plate is placed at an inclination of 20°, on Macy's principle, which has the effect of diminishing the smoke-box vacuum by about 30 per cent. The fire-box is of copper, and has an arched roof of corrugated plate, which does away with the use of the cross stays. The whole of the engine, with the exception of the top of the chimney, is covered in, in order to protect the driver and fireman, as well as the machinery from smoke and falls of rock from the roof.

The leading dimensions of the two engines called "Tribus" and "Banyai Reitz" are given in the table:

Width of gauge	2 feet 3·5 inches.
Diameter of wheels	1 " 5·6 "
Wheel base	3 " 1·4 "
Diameter of cylinder	6·3 "
Length of stroke of piston	8·7 "
Effective steam pressure	10 atmospheres.
Heating surface of tubes	79·7 square feet.
Heating surface of fire-box	15·0 "
Total heating surface	94·7 "
Grate surface	1·9 "
Total weight	4 tons 8 cwt.
Weight empty	3 " 13 "
Water carried	48 gallons.
Coal carried	154 lbs.
Power of engine	10 H. P.
Minimum radius of curvature safe for traveling	72 feet.
Extreme length	12 "
Extreme breadth	4 " 3·1 inches.
Extreme height	6 " 2·8 "

These engines have been in use since the commencement of 1876. The average time taken by one trip, starting with an empty train at the washing works and returning to the same point with a full load, is forty minutes of running time and nine minutes stoppages, or a total of fifty minutes. In the shift of ten hours twelve trains are run. The net load drawn is 20 tons 8 cwt. per train, or 245 tons per day. This result is obtained with an average steam pressure of 77 lbs. The coal consumed is 52·8 lbs. per hour, or 633·6 lbs. per day, and the water evaporated per train 29 gallons, being well within the capacity of the tank, which holds 35 gallons. The level is kept free from smoke by the ventilator, a Guibal fan, of 29·5 feet diameter and 6·5 feet breadth of face, driven by a 70-H. P. steam-engine, placed in a side chamber near the mouth of the level, a speed of 20 revolutions per minute being sufficient to maintain the necessary purity of the atmosphere for the men traveling in and out of the mine. The air doors at the ventilator drift and the crossings are guarded by lamps with reflectors, and, as a guide to the driver, distance marks are placed at intervals of 100 yards, in addition to which there is an electric telegraph, with bells, for signaling the train at either end.

The rails are very liable to get into a greasy state from the formation of a soapy covering by small coal-dust mixed with droppings from the axles and atmospheric moisture, causing the engine to slip when going up the line. This could only be partially removed by the use of sand-boxes, until by Heinrich's plan of squirting a jet of hot water from the boiler immediately in front of the driving-wheels, the top of the rail was completely cleaned from all adhesive matter, as well as from ice or hoar-frost in winter. The co-efficient of friction upon a clean-washed wet rail under these circumstances does not appear to be much lower than that of a dry one.

Before the introduction of locomotives eight horses were used in the level, and in the shift of twelve hours drew out 180 tons of coal. For the present output thirteen horses would have been required, under which conditions the cost of the work would be as follows:

	£	s.
Thirteen horses at £5 each = £65, at 6 per cent per annum	3	18
Cost of stabling, £50, at 6 per cent per annum	3	0
Cost of forage, at £35 per horse per annum	455	0
Horse-keepers' wages, 4 at £30 each	120	0
Total annual charge	581	18

Equal to a daily cost of 39s., or about 2d. per ton of coal drawn.

The cost of drawing by locomotives, on the other hand, is made up of the following items:

	£
Two locomotives at £600	1,200
Cleaning shed and water station.	400

1,600, corresponding, at 6 per cent per annum, to a daily charge of	s.	d.
	6	6
Wages—driver 4s., fireman 3s. per day	7	0
Fuel 4s. 7d., lubricating materials 1s. 5d.	6	0
Cost of repairs	2	6
Total daily cost	22	0

Or rather more than 1d. per ton of coal drawn.

The saving by the use of locomotives over horse traction is, therefore, about 44 per cent. H. B.

WOOD INJECTION.—The value of creosote as a wood preserver is generally recognized, but the direct injection requires great quantities of heavy oil, and a desiccation of the injected pores. The high boiling-point of creosote (300°) does not permit its employment in vapor. John Blythe formed the idea of saturating a jet of steam with creosote in minute division, forming, so to speak, a gaseous emulsion. The apparatus comprises a high-pressure steam-boiler; another boiler containing creosote, in which the steam is saturated; a vat, filled with creosote, to be pumped into the boiler; sheet-iron cylinders, for the pieces which are to be intected; and a system of tubing connecting the several parts. In this way Mr. Blythe completely fills the heart of oak, pine, or red beech; he uses 2 to 3 kilos. of creosote for a cross-tie, and 2 kilos. of brown phenic acid per cubic meter of saturated wood or cross-ties. The cost of preparing a cross-tie, measuring 0·085 m., is from 0·60 f. to 0.70 f. The apparatus can prepare 500 ties per day; the wood comes out softened, so that it can readily be bent or shaped, but it rapidly hardens; at first it shrinks, but after a few weeks it becomes seasoned and resists the influences of moisture; finally, the fibers are greatly strengthened.—*Ann. des Ponts et Chaussées.*

THE METALLURGY OF NICKEL.

By M. Badoureau, in Annales des Mines.

[*Continued from page* 361.]

EXAMPLE FROM THE GEORGES WORKS, NEAR DOBSINA.

In 1867 the methods in use at Dobsina were different from those in use at present in two points: 1. The ore was picked with less care, so that the cobalt and nickel ores contained more copper than at present. 2. Instead of carrying the treatment of these ores as far as to nickel cubes and cobalt oxides, it was considered enough to make a speiss rich up to 33 per cent for sale.

I. *Roasting.*—The ore was roasted in kilns as at the present time.

II. *First Melting.*—The roasted ore was melted with only the addition of the cinder from the concentration of the speiss. There were passed 11 tons of ore per day, with a consumption of 2·7 tons of soft wood charcoal. Speiss and matte were got. The speiss contained 7·8 per cent of cobalt, and 13·8 per cent of nickel. The matte contained 2·2 per cent cobalt, 1 per cent nickel, and 3·5 per cent of copper. The slag contained in the state of silicate, 0·38 per cent cobalt and 0·06 per cent nickel. It contained no particle of matte or speiss. The vapors from this operation were not utilized, and were of a harmful nature; the workmen breathing them suffered from abscesses in the nose.

III. *Treatment of Matte.*—As the matte carried off the copper, it was convenient to treat it separately, so as not to reintroduce the copper into the batch. The matte was treated in a calcining furnace; the cinder was removed frequently, and after each skimming sand and quartzose ore were added. The cinder contained little cobalt or nickel in the condition of silicate, but it contained grains of matte; they were sent back to first melting. Separate speiss and matte were generally yielded by this operation. Where this result was not attained, the stuff was remelted with an equal quantity of mispickel and a little acid nickeliferous and cobaltiferous slag; matte and speiss were thus obtained. It was difficult to get useful copper from the matte; the speiss was added to that got directly from the first melting.

IV. *Roasting First Speiss.*—The speiss got by any of the foregoing operations was melted on the hearth of a Hungarian furnace, which is still kept at work, though it now treats richer speiss than formerly. When the mass was melted, blowing began, and scum floated up and was removed. At this moment the fire was slackened to allow the sulphur to burn up, the iron to oxidize, and the speiss to fall on the hearth. The scum contained 6·24 per cent nickel, and 3·48 per cent cobalt. Melted down in a crucible, they yielded 12 per cent speiss and 41 per cent matte. This latter contained 6·6 per cent cobalt, and 6·0 per cent nickel. The scum was sent back to mix with stuff for first melting. The second speiss contained an average of 27 per cent nickel and cobalt.

V. *Roasting for Third Speiss.*—A part of the second speiss was subjected to a second roasting, which brought its richness up to 33 per cent.

EXAMPLE FROM THE PHŒNIX WORKS, DOBSINA (1867).

In the foregoing example the nickel was more abundant than the copper; in the following it is the copper which predominates.

I. *Roasting.*—The ore was first of all roasted with four fires.

II. *First Melting.*—The roasted ore was melted with quartz and matte was got.

III. *Matte Roasting.*—The matte was completely roasted with eight fires.

IV. *Second Melting.*—The first roasted matte was remelted with quartz, and there was got a very rich cupriferous matte which yielded good black copper. Almost all the nickel and cobalt, and a part of the copper, had gone into the slag.

V. *Melting the Slag for Speiss.*—The nickeliferous slag was melted down with arsenic and sulphate of baryta. The slag obtained ought to have been basic and yet poor in iron, so as to be equally poor in cobalt. Speiss and matte were got at this operation, but only the speiss was treated for nickel.

VI. *Roasting the Speiss.*—The speiss was roasted in kilns.

VII. *Roasting for Second Speiss.*—The speiss once roasted was roasted a second time in a Hungarian furnace with the object of enriching it with nickel and cobalt. It was run on to arsenic or orpiment, so as to separate it into matte and speiss. The latter was sold to special refineries.

EXAMPLES FROM KAAFJORD (NORWAY).

In Saxony there is a refinery, the name of which I forget, at which ferruginous balls containing nickel and cobalt were successfully treated. It was impossible to break up these balls at the stamps on account of the molybdenum they contained. The following is an analysis of them:

Fe	80·0
Cu	2·5
Ni	2·0
Co	1·5
Mo	6·0
S	8·0
	100·0

The metal was melted down in a crucible, and, at the moment of running it off, a jet of air and a jet of water were thrown upon the stream of metal, which they granulated. This was roasted in the reverberatory furnace, and then melted in it with quartz, so as to scorify the greater part of the iron and get a regulus rich in molybdenum, nickel, and cobalt. Carbonate of soda and saltpeter were added to the regulus, and it was roasted in the same furnace. Treating it with water, the alkaline molybdate was dissolved, and there was left behind a residue of mixed nickel, cobalt, and copper oxides. Melted down with mispickel, a speiss was got which was sold to other refineries.

TRANSFORMATION OF MATTE OR SPEISS INTO OXIDIZED HALF-STUFF. THE DRY WAY.

Theory of Operation.—When matte or speiss contains only nickel, it yields nickel oxide on roasting. The arsenic is got rid of with difficulty in this roasting; recourse is had to carbon, which reduces arsenic acid to the state of arsenious acid and the latter to metallic arsenic. The arsenious acid distills and condenses in condensation-chambers. The same takes place with metallic arsenic, except that the latter changes back to arsenious acid in the chamber of condensation. Sometimes the azotate

of soda process is adopted, the arsenic being transformed into an alkaline arseniate easily removed by washing. Antimony, when it exists in speiss, is still more difficult to get rid of than arsenic. When, besides nickel, matte or speiss contains a certain proportion of copper, no difference is made in the method of operation; instead of getting pure nickel, an alloy of copper and nickel is got, which is an excellent material in the manufacture of German silver. If too much copper is present in the stuff after it has been roasted, some can be got out by means of dilute sulphuric acid, which has an especially dissolvent effect on the oxide of copper.

When the matte or speiss contains but a small proportion of cobalt, the latter can be separated either as an oxide or a silicate, profiting by the circumstance of its being more oxidizable than nickel. When the cobalt is present as an impure silicate, there are two processes for preparing cobalt oxide. The first consists in reducing the silicate by sulphur or arsenic by melting it with carbonate of soda, and thus obtaining cobalt sulphide or arsenide, which is afterward melted. The second process consists in melting the silicate in a crucible, so as to separate the grains of speiss, grinding and melting with an excess of alkaline carbonate and azotate of soda. Treating the product with hot water, there remains a mixture of cobalt oxide and colorless silica-dust, which is carried down by the water and has no prejudicial effect on the cobalt oxide.

Should cobalt be present in large proportions in the matte or speiss, the separation must be made the wet way.—*Iron.*

(TO BE CONTINUED.)

THE MINNEAPOLIS MILL EXPLOSION.

The flourishing manufacturing city of Minneapolis, Minnesota, was visited by a great disaster last week. At seven o'clock in the evening, at the hour when the night hands were relieving the day hands, an explosion occurred in one of the great flouring mills, and instantly that mill and several adjoining ones, together with a large grain elevator, were wrapped in flames. So suddenly and so generally did the flames envelop the adjacent buildings, the fire department was unable to save any of them. Eight flouring-mills, one planing-mill and the elevator were destroyed, and fourteen of the employés in the mills lost their lives. These victims were killed by the explosion, not suffocated by the fire. The explosion is reported to have resembled an earthquake; it was distinctly heard at St. Paul, ten miles distant, where, also, the column of flame that shot up simultaneously was seen. This is a terrible blow to the industries of this thriving city, one of the most prosperous of the Northwest. The mill in which the explosion occurred was the famous Washburn mill, the largest in the world save one. It had forty run of stone within its walls, while a mill in France has forty-two. Minneapolis flour is celebrated throughout the world for its superiority over all others, and commands a dollar or two more per barrel in all markets than any other. This is due to the excellent quality of the Minnesota spring wheat in part, but mainly to the new process of manufacture, first introduced in Minneapolis mills. This process is known as "the middlings purifying process," which involves two grindings of the wheat, the finest quality of flour being obtained from a regrinding of the middlings. In consequence of the introduction of this process and the superiority of Minnesota wheat, Minneapolis ranked as the first flour-producing city in this country, one hundred and ninety-five run of stones being in operation day and night. The late disaster destroyed eighty-five of this number. The owners of the destroyed mills announce their intention to rebuild at once, but a season's work will be lost at least. Governor C. C. Washburn, principal owner of the Washburn mill, proposes to erect one with fifty-two run of stones.

The Minneapolis explosion very much resembles the Barclay-street disaster that occurred in this city a few months since, and which has never been satisfactorily explained. In both instances, a loud explosion was followed by the projection of a column of flame high in the air, and the crumbling of the walls of the building; both explosions also entailed considerable loss of life. It was generally believed at the time of the Barclay-street explosion that it arose from the ignition of fine particles of starch floating in the atmosphere of the rooms, which were used for the manufacture of confectionery. It is asserted that the Minneapolis explosion resulted from the ignition of the fine particles of flour with which the air in the mill was loaded. Some months since, these fine particles of flour were seen to ignite in the bolting-room of the same mill. On that occasion the flames were put out by an attendant, gifted with unusual presence of mind. Then it was declared that the cause of the fire was a nail which got between the mill-stones and threw off sparks. It has been demonstrated heretofore that these fine particles of flour were highly inflammable, and their explosive qualities now seem to be equally well established.—*National Fireman's Journal.*

SOUTHERN MINES.

Special Correspondence of the Engineering and Mining Journal.

The Western miner traveling in the Georgia is struck with the ridiculously low expenses of mining, the extent and richness of the deposits, and the certainty of profit with most primitive methods and common field labor. The writer would not venture to publish the following statement as to expenses without having first had ocular evidence. The general estimate of the cost of mining and milling where steam power is used does not exceed $1.50 per ton, and where water-power is used, about one half of this. At the Fairmount mines, near Dahlonega, I was shown the books of the company for the ten months' work done by it with its steam 10-stamp mill and in its mines. It has mined and milled an average of about 20 tons per day at an average expense of $18.85. The Findley mines adjoining have water-power for mill and also to sluice their ores from the veins to the mill floor. The expense account for last five months averages less than $19 per day, while the average amount of ore handled was about 50 tons per day, or a total expense of 40c. per ton. Miners' wages are from 75c. to $1 per day. They are faithful, competent, and work from sun-up to sun-set. The nature of the ground is such that miners make wages by contracting to run tunnels at from 20c. to $1 per foot. Of course no blasting is necessary and rarely timbering. The writer saw a shaft over 80 feet deep cut over 30 years ago in the talcose shale, in which no timbering had been done, but though the mouth of the shaft was open, the walls were as sharply defined as if cut in granite. Water powers are frequent, and in some cases convenient and ample for extensive mining. At the Franklin mill the water power at mean low water measures over 1000 H. P. The climate is perpetual summer, extremes of temperature being about 15° and 90°. The country is well settled, cultivated, and fertile, with excellent railroad facilities. These things account for the comparatively insignificant expenses of mining, which in their turn account for the absence of those magnificent failures which are incident to mining in the West, where mining and milling ores costs from $25 to $100 per ton, and where operations are on a corresponding scale. It is quite true that the yield of the mass of the Georgia ores seems almost as insignificant as the expenses, but the yield has the virtue of being in favor of the miner, under the most adverse conditions known in the region. In Lumpkin County, the present center of activity, and where there are some 200 stamps at work, or being placed in position, the average yield is from $2 to $5 per ton. In Cherokee County, at the Strickland, Franklin and Pasco Mines, the average reported is about $12 per ton; further south, at the Cherokee and Bonner, $6 to $10 per ton. These are almost exclusively free gold or milling ores, for as yet no effort of importance has been made to reduce the sulphurets, which assay from three to ten times as high as the free gold ores. Up to a late date only wooden stamps, with square iron shoes, were used, and the tailings are said to pay for handling by the pan or rocker. The Georgia gold belt is co-extensive with leading Western formations, and it has a record of "strikes" that compare favorably with the best of the latter. The following are among the best authenticated.

The Findley shaft, a narrow incline 160 feet deep, yielded over $90,000; near by, Col. Hand took, from 4½ cubic yards of gravel, 425 dwts. of gold. The two Castlebanys got over $75,000 from Pigeon Roost placer, and on White Path placer, over $30,000 were taken out in one week. One pit on the John C. Calhoun produced over $23,000 in a month, and on the Passmore vein, twenty days' digging in the soft shale yielded $10,000. The State geologist, Dr. LITTLE, vouches for over $100,000 being taken from one forty-acre lot by pan and rocker. From a single open cut on the veins of the Franklin, measuring about 22,000 cubic yards of excavation, over $280,000 were coined at Dahlonega, while from the Strickland, three and one half miles distant, over $150,000 were taken in three years. A small party washed out 5000 dwts. of gold within six weeks, from the bed of a branch near Villa Rica. Judge ZED. BONNER made, with a small mill, about a half million dollars from his mines in Carroll County. From the Towers, three miles northeast of the Franklin, an open cut of twelve feet deep yielded $40,000. The Sixes, a placer mine of forty acres in Cherokee County, yielded over four million dollars. One nugget was washed out weighing 1432 dwts., and nuggets were frequently found weighing from 20 to 200 dwts. These "strikes" were supplemented by the operations of the mint at Dahlonega, which during the years of its activity coined some half million dollars annually from the surrounding mines, or rather washings, for this was mainly taken out by pan and long Tom. The Georgia field is just awakening from the long neglect caused by the California fever and the war, and everywhere are signs of intelligent activity that are fairly measured by the statement of Messrs. PORTER & MEAKEM, of Atlanta, who have built about 25 batteries of five stamps each, best California pattern, within the last ten months. They say that where they received one inquiry for mining machinery six months ago, they receive a hundred now.

PETROLEUM NOTES.

COMPARATIVE SYNOPSIS OF REPORTS FOR FEBRUARY AND MARCH AND APRIL, 1878 AND 1877.*

42 GALLONS = 1 BARREL.		1878.		1877.	
		March, 31 days.	April, 30 days.	March, 31 days.	April, 30 days.
Stock at the Wells	Bbls.	162,410	170,304	153,631	153,923
Production for the month	"	1,208,380	1,195,890	901,697	972,810
Daily average production	"	38,980	39,863	29,087	32,427
Iron tank stock	"	4,180,422	4,521,786	3,056,823	3,125,815
Total stock in the region	"	4,342,832	4,692,090	321,454	3,279,739
Shipments out of the region	"	741,512	846,632	913,919	903,526
Number of producing wells		8,848	9,071	6,666	6,846
Number of drilling wells		379	409	395	448
Number drilling wells completed		211	320	291	269
Aggregate daily production of new wells in bbls		2,900	4,442	3,344	3,608
		February.	March.	February.	March.
Exports from New York	Gals.	12,025,653	9,342,656	9,955,850	16,614,330
" " Boston	"	316,068	214,402	111,547	360,224
" " Philadelphia	"	2,752,864	2,375,996	5,045,287	299,443
" " Baltimore	"	1,733,937	2,600,742	2,489,344	2,128,105
" " Richmond	"	5,000	5,000	.....	.....
" " San Francisco	"	16,174	.....	44,950	104,990
Total exports	Gals.	16,849,676	14,538,796	17,646,978	19,507,092
Production in Pa	Bbls.	1,094,856	1,208,380	783,412	901,697

*Official.—*Stowell's Petroleum Reporter, May 15th,* 1878.

THE CANADIAN OIL INDUSTRY.—The *Petrolia Advertiser* of the 24th May says: "After so long a quiet in business, particularly the oil business, it would seem as if a change for the better was about to take place, and the dark cloud that has hung over us like a pall was to be broken asunder, and the sun of prosperity again shine resplendent in our midst. During the past week some good strikes have been made, the best among which is that of Messrs. Bennett & Crosbie, who have succeeded in getting a splendid well on the old Hillsdale property, close alongside Mr. Bennett's old one, which is good for 70 barrels. Mr. Robert Paul has a good one, which is doing fully 40 barrels. The London Company have again been successful, and have added number eight to their new strikes on the Toronto property, which is good for ten barrels. Messrs. Beresford and Ward's last venture has just been torpedoed, and is now good for 15 barrels right along. Mr. Canneff is about sinking two more wells on his present location, which, when completed, will make five in all. On Tuesday next, the wells owned by Messrs. Kennedy, McDonald, Noble, and Callianan, on lots 5 and 6, in the 12th concession of Enniskillen, and which have been shut down since last Christmas, will be started up again and put in full running order. Now that our shipments are increasing, more developments will be gone on with."

COMPARATIVE AGGREGATE SHIPMENTS of petroleum, reduced to barrels of 40 gallons each, from Petrolia, Ontario, Can., during the last five years up to date: From Jan. 1 to May 23, 1878, 42,754; from Jan. 1 to May 23, 1877, 167,128; from Jan. 1 to May 23, 1876, 105,298; from Jan. 1 to May 23, 1875, 52,237; from Jan. 1 to May 23, 1874, 68,785.

COMPARATIVE SHIPMENTS OF CRUDE PETROLEUM reduced to barrels of 40 gallons each, from Petrolia, Ontario, Can., during the last five years up to date: From Jan. 1 to May 23, 1878, 35,095 bbls.; from Jan. 1 to May 23, 1877, 125,651; from Jan. 1 to May 23, 1876, 91,375; from Jan. 1 to May 23, 1875, 45,857; from Jan. 1 to May 23, 1874, 73,504.

INCREASING OUTLETS FROM THE OIL REGIONS.—Several well-known Philadelphia capitalists and a number of wealthy men in Oil City have purchased the right of way for an oil-pipe line between Parker City and Columbia. At the latter point connection is to be made with the Philadelphia and Reading Railroad, which company will ship the oil to this city. The only direct outlet from the oil regions to the seaboard is by way of the Pennsylvania Railway, but oil is also shipped by the Pipe Line to Pittsburg, and from that point to Baltimore by the

Baltimore and Ohio Railroad. It is the intention of the projectors of the new enterprise to lay at once one six-inch pipe between the places named, and this will afford facility for the shipment of one fourth of the entire production of the region. The capacity of the pipe will be about 12,000 barrels per day, and it is proposed to begin the work at once so that active shipments may be inaugurated by the end of summer. Arrangements have been effected with the Philadelphia & Reading Railroad Company, who will, it is stated, carry the oil from Columbia for 10 cents per barrel to this city, and 20 cents to New York.

The *Western New Yorker* says: "The State Line Railroad is already reaping a benefit from the carrying trade in crude petroleum. Trains of twenty-five tanks each are of daily occurrence over this thoroughfare. These tanks are filled from the Bradford and Salamanca Pipe Line reservoirs at the latter place, and are run to market quicker and at less expense than by any other route. Four new engines have been added for this work, and they are having all they can do."

OIL DISCOVERY IN OHIO.—WARREN, May 21st.—The oil excitement in Green Township continues. A number of parties are engaged in leasing territory adjacent to the Comstock farm, where the oil was discovered. The farmers living in the vicinity have raised the value of their property to nearly double what it has been. The Fife well is still pumping at the rate of thirty barrels per day. The oil has a ready market.

Regarding this strike, the Cincinnati *Inquirer* of the 27th inst. says: "Messrs. Scott & Lucas have completed leases for over fifteen hundred acres of land in the new oil territory in Greene township. L. M. Dennison has struck a good well on the Phillips farm that will yield him about fifteen barrels daily. The oil has been tested, and was found to possess a specific gravity of twenty-one, four better than the specific gravity of the Mecca oil. This will make it worth considerable more than the Mecca product. Fife & McLain have contracted for one hundred barrels of the oil as soon as it can be barreled at $20 per barrel. The oil belt is thought to be about a mile wide and of unlimited strength, running parallel with Lake Erie, with an angle of forty-two degrees. A number of speculators are putting in their appearance, and it is likely that in the course of a few weeks the territory will be covered with wells."

SOME OPERATORS from the Bradford oil regions are putting down a test-well near Ashtabula, Ohio.

A NEW OIL BASIN, 875 feet deep, has been discovered near Titusville, Pa.

THE KANSAS CITY GAS WELL.—The Kansas City *Times* says: "The existence of a vast inexhaustive gas reservoir beneath this city appears to have been settled beyond all question. Three separate and distinct wells sunk in this city, one in Wyandotte and one in Westport, have struck this natural gas reservoir, and, notwithstanding the fact that gas has been escaping from one of these wells for nearly five years, the pressure and volume of gas are larger now than when the reservoir was first punctured by the drill."

THE MARKET AT NEW YORK.—The *Shipping and Commercial List* says:
Crude—The demand has continued very light, and prices have undergone no very decided change. Bulk is quoted 7½ cents, and bbls. 9¼@9¾.
Refined—The movement continues undeniably slow, yet refiners manifest no disposition to press, though generally willing to meet the views of buyers, whenever they can insure purchases. We hear of no transactions. The market closed 11⅝ cents bid here, 11¼ in Philadelphia, and 11¼ in Baltimore. Case oil is unchanged. 50,000 cases have changed hands on private terms—held at the close 14¾ cents.
Naphtha—Remains quiet, but prices are nominally the same—6@6¼ cents.
Residuum—Has undergone no change of moment, being still nominal at 6¼@7 cents.
Certificates—Have been dull, and prices have declined. The transactions at the Exchange comprise 45,000 bbls. United within the range of $1.25⅝@$1.30⅝, regular. Oil City quiet, $1.25 bid; Titusville dull and heavy, $1.45 bid; and Parker's $1.25⅝ bid.

Exports of Refined, Crude, and Naphtha.

	1878. Gallons.	1877. Gallons.
Since our last	499,456	.....
Previously since Jan. 1	60,080,927	73,226,916
From other ports	25,323,055	28,614,056
Total	85,903,438	101,840,972

London, May 27.—Refined spot dull, 9⅝d.; last four months, 10¼d.
Antwerp, May 28.—Refined steady, 26⅛f.

Exports of Refined, Crude, and Naphtha, from all Ports, Jan. 1 to May 24.

	1878. Gallons.	1877. Gallons.
From Boston	1,325,625	1,423,497
Philadelphia	13,656,055	14,749,558
Baltimore	10,331,425	10,999,570
Richmond	10,000	.....
San Francisco	.....	149,940
Total	25,323,105	27,322,565
From New York	60,080,927	69,246,960
Total exports from the United States	85,404,032	96,569,525
Same time 1876	.....	73,192,892
Same time 1875	.....	66,655,362

COAL OIL INSPECTION IN OHIO.—The General Assembly of the State of Ohio, on the 15th ult., passed an act providing for the appointment of an Inspector and Deputy Inspector of mineral oils, and to regulate the sale of the same for illuminating purposes. All oils which will not bear the 120 degrees Fahrenheit test are forbidden to be sold. The Inspector is allowed to test with an open cup, in the manner definitely described by the law, or to use Foster's patent cup. Every vessel of oil inspected and found to be of the standard quality is to be marked with an official stamp "approved," signed by the inspector and giving date of inspection, and in other cases he must mark in like manner the same, "rejected for illuminating purposes." The penalty for selling without inspection is a fine of from $100 to $300, and for counterfeiting inspection certificates the penalty is a fine of from $100 to $500. Consumers are to be punished for knowingly using uninspected oil—fine from $20 to $100 each offense. Penalties are attached to a failure to remove inspector's stamp from empty barrels and for keeping for sale uninspected oils. Persons selling uninspected oils are to be responsible for all damages resulting to any purchaser from the explosion of such oils.

WAGES REDUCTION OF PIPE LINE EMPLOYÉS.—A reduction in the wages of employés of the United Pipe Lines will take place on the first of June. The men are to be paid as follows: Gaugers, $75 per month; engineers (main stations), $70, and when telegraph operator, $5 extra; engineers (local stations), $60, with $5 extra when telegraph operator; foreman of construction, $65; men on construction, $50; district telegraph operators, $60; all other telegraph operators, $50; rack men, $65.

THE TELEPHONE IN AUSTRALIA.—Experiments made from time to time with the telephone in Victoria have been attended with considerable success. Conversation has been carried on between Melbourne and Albury (about 190 miles distant), and Melbourne and Ballarat (100 miles). The telephones in use were constructed in the Melbourne telegraph office, from descriptions of Professor Bell's apparatus.—*Engineering.*

MINING NEWS.

MISSOURI.

Special Correspondence of the Engineering and Mining Journal.

Dr. Weise, lately in the employ of the St. Louis Silver Smelting and Refining Company, is superintending the Oronogo mines of the Granby M. & S. Co.

The amateur miners or silent partners of working miners in the Southwest are abandoning their interests. It must necessarily react upon the production of the future.

It is difficult to tell with whom the adventurous mining system of the Southwest has become more unpopular, with the miners or the companies.

A remarkable feature in the Southwest is the entire absence, at present, of ill-feeling between miners and companies. I can account for it in no other way but that common sufferings make mutual friends.

Colorado bonanza sensationalists are badly wanted in the Southwest for a sound thrashing.

Many companies are preparing for day-labor mining operations.

The Oronogo mines, with the exception of a few lots still held on the adventurous plan by unexpired leases, will be operated henceforth by hired labor exclusively. An examination of divers shafts and drifts in the immediate vicinity of the dressing works now being erected at that place by the Granby M. & S. Co., demonstrated the existence of broken chert beds, 15 to 20 feet, all in small, broken and crushed layers, containing between their seams and cavities from 15 to 20 per cent of zinc-blende and galena. This percentage includes the frequent occurrence of pockets, which makes the percentage uncertain, with the probability of an average paying grade.

Only one fourth of the rock is unfit for crushing. As there are numerous shafts of this nature at Oronogo, and those all near each other, the pay rock in many instances commencing right at the grass-roots, there will be no difficulty in supplying the crusher with good pay matter. I estimate the relation of zinc to lead deposits as 2 to 1.

Wages are very low; underground $1, top-hands 75 cents a day. The company will pay more when, after completion of the works, the yield and profits shall warrant it. I am told by Mr. Mesplay, the Assistant Superintendent, and an old Granby miner of excellent repute, that for one dollar a day he could draw the last miner from Granby to Oronogo. That's mighty hard on that old, renowned burgh.

The Webb City Zinc Dressing Works are running, supplied by two shafts.

Joplin quotations for No. 1 Blende are $12 per ton; neutral mineral, $17 to $18.

The Lone Elm White Lead Works, of Joplin, offer to smelt the mineral of other companies, in consideration of the smoke (fumes) and the slag.

The old Duff diggings northeast of Joplin, mentioned in Professor Swallow's first report, are being mined once more.

Elliot & Walker, south of Webb City, claim the existence of good zinc deposits on their tract.

Mr. H. Weyman, purchasing agent of the Martindale Zinc Company, leaves for Europe next month. Mr. W. is one of the most successful zinc miners of the State.

I learn of the temporary cessation of the Desloge mine, St. Francis County. Mr. Firmin Desloge is expected in Joplin to examine the White Lead Works attached to the smelters of the Lone Elm M. & S. Co.

Some interesting struggles may be expected between the American White Lead Association and the Bartlett Patent Combination.

The Future City Miners' oil takes well at Joplin.

Mining operations have been recommenced at the Beef Branch diggings, Newton County. B.

CALIFORNIA.

THE BODIE MINING DISTRICT.

From the *Standard* of May 21st we take the following concerning some of the principal gold mines of this district:

"*Standard.*—The new shaft in this mine has reached a depth of 500 feet. The ground is good blasting porphyry. The north drift, on the 650 level, is in 343 feet; progress during the week, 24 feet. The ledge is looking well; the stopes also look splendid. The cross-cut, to connect with the Bulwer, is now in about 50 feet. Excellent progress is being made in this cross-cut. The mill has been running constantly ever since it started up, and crushes from 60 to 70 tons of ore per day. The new pans and settlers work finely. The mill is now complete in every department, and it may confidently be expected that the amount of bullion shipped will be greatly increased. This company has paid $450,000 in dividends to its stockholders during the last nine months, the last, of $1 per share, being paid on the 13th of May. The mine produced during this time $675,000 in bullion."

"*McClinton.*—West cross-cut on 300-level advanced to 133 feet. The company has intersected another vein in this cross-cut, and, although not large, it looks promising and is well defined. All the drifts north, opening on a softer formation, are expanding in size and improving in quality. The Jayhawk shaft has reached a depth of 85 feet. The ore assays well and the vein is well defined, with a clay gouge following the hanging wall. The outlook generally seems favorable."

"*Black Hawk.*—The shaft in this mine has attained a depth of 303 feet. At 300 feet they will open a station to run into the ledge. The bottom of the shaft seems to be of a vein formation, with a small stratum of vein matter. Have shipped altogether during the week about 25 tons of ore to the Miner's Mill."

"*Bechtel.*—The rock in the bottom of the incline of this mine still continues very hard. The work of drifting still continues with the usual rapidity. Shipping about 40 tons of ore per day to the Syndicate mill, which has started up." This company has levied its first assessment of 50c. per share delinquent on June 3d. This stock is selling on the San Francisco market at from $1 to $1.25 per share.

"A rich strike was made in this mine on the 21st May. In the cross-cut on the 355 level a fine two-foot ledge was struck. The officers of the company do not claim to have struck a bonanza, but the indications are very favorable for opening out a fine body of high grade ore. The importance of this recent development can not be overestimated, as it shows conclusively that there is still ore of good quality in the mine."

"*Goodshaw.*—The shaft in this mine has now reached a depth of 78 feet, and the rock is very hard. During the last few feet fine-looking quartz has been struck. The vein is very narrow, being only about eight inches, but is free milling ore and assays in gold $2.51; silver, $17.27; total, $19.78. A slight flow of water is coming in."

"*May Belle.*—Shaft down 140 feet. Drifting south from the bottom of the shaft and now in a distance of 30 feet. There is good ore in both shaft and drift and looks well in the face of the drift. The ledge split after going down 75 or 80 feet, and it is proposed to sink an incline in order to tap the ledge where it comes together. The mine was formerly known as the Baltimore American, but was incorporated as the May Belle."

COLORADO.

PROSPECTING AMONG THE LEADVILLE CARBONATES.

"The city of Leadville lies next the wooded hills of the Mosquito range, in the valley between this spur range and the main snowy range of the Rocky Mountains, having a southern exposure, and protected on the west and north by hills thickly studded with pine timber and undergrowth. The mineral belt as thus far prospected, beginning just back of the city, extends north along the line of the Mosquito range to the head-waters of the Arkansas, some twenty miles, and south

from Leadville, at irregular intervals, discoveries are mentioned for twice that distance. The most development, and, consequently, the richest portion, is between Evans Gulch and Empire Gulch, some seven to ten miles. Prospecting is vigorous within these limits, even up to and above timber line in places.

"The number of business and residence houses of all classes and kinds is about five hundred, and more constantly going up. One main street, four blocks in length, compactly built, does the principal business of the city, aside from that of the smelter and sampling works. A parallel street on either side of this principal thoroughfare makes some pretense to business, but without much success so far. In the lines of staple groceries, provisions, hardware, and liquors, the supply seems superabundant and the margins for profits small. Hotels and restaurants are numerous, and the prices six to eight dollars per week for day board, eight to ten, including bed, and fifty to seventy-five cents for single meals. Persons batching live comfortably at an expense of two dollars and a half per week each, or one dollar more, upon the best the market affords. Butter is 40 cents, eggs 30 cents, porter-house steak 15 cents, potatoes 5 cents, and other edibles at proportionately low figures. The necessaries of life are cheap, with the exception of beer and whisky, which retail at 25 cents per drink.

"Miners' wages are from three dollars to three fifty per day, the latter price not including board, common labor two dollars and fifty cents per day without board, mechanic three to four dollars per day. There are fully three thousand people in Leadville and the hills in the immediate vicinity.

"The prospector understands that if he strikes mineral in place, he can get an immediate offer in cash that will pay him handsomely, and as only shovel, pick, windlass and grub are required to sink through the loose rocky soil 30 to 120 feet, at it he goes, trusting to luck that he will strike it rich. Hence the large majority of men around Leadville come here to dig on their own account, and will keep at it so long as they can obtain provisions, or until they become mine owners. Other men are on the look-out for a party to take hold with them in a location for an interest payable in labor or grub. Another class get ground contiguous to a paying mine, in order to sell out on the reputation such proximity carries with it. It is a mistaken idea that all the ground is staked off and claimed; but no matter if it is, no claim is valid until mineral has been found in place. Men are sinking holes within one or two hundred feet of each other, understanding full well that whoever reaches mineral first is entitled to choice of location, even if it takes in the shaft of other parties. Miners dislike to cover with their location by priority of the discovery of mineral the shaft of another miner, and a compromise is generally effected by which a partnership occurs, or a sale is effected. Thus it happens that new-comers have an equal show with men already here on the ground. Instances are numerous in which ten and twenty foot shafts, sunk in promising localities, have been sold for from two to eight hundred dollars before any mineral had been discovered. Hence the stimulus to prospecting by every body with the means to command the inexpensive outfit requisite for work.

"It is not unfrequent that a buyer gets an interest by agreeing to sink the shaft a specified number of feet, and then hires his partners to do the work. This gives the poor man pay for sinking upon the property in which he still retains an interest. Again, a man, by paying a small bonus, gets a bond upon a location for say ninety days, agreeing to pay $500 therefor. He then finds a man that will sink the shaft for a quarter interest. If mineral is struck, he pays the $500 and has an interest in a property that he can at once double or quadruple the money invested; if nothing is struck, he forfeits his bond, and is very little out of pocket.

"Owing to the fact that so many men are prospecting, it has been almost impossible to hire laboring men at prices ranging from $2.50 to $3 per day. Yet men coming here on such an announcement as this must bear in mind the character of the camp. Men here work for themselves so long as they have 'grub,' and then hire out for a 'grub stake,' as they term it, and when that is earned leave their situation open for other men. So, though there may be a chance for fifty men this week, there is no certainty about it continuing the next. I would not advise a single man to come here, nor would I say a word to discourage his coming. Men with teams are in demand at present, but perhaps a rush here would make it doubtful about getting steady employment. Lots on the main street (Chestnut) range from $500 to $1000, a few streets away $10 to $50, and back of that no price at all.

"The camp is quiet and orderly even at night, when hundreds of men are congregated in the stores and saloons.

"Recently a grand banquet was tendered to the engineers of the Atchison, Topeka, and Santa Fé on the completion of their survey into Leadville."—*Denver Tribune.*

DAKOTA.

THE COAL DEPOSITS OF THE BLACK HILLS.

A correspondent of the Pottsville *Miners' Journal* of the 24th of May, writing from Deadwood under date of May 11th, says:

"Careful projecting has developed the fact that there is soft coal almost everywhere to the west and northwest of here, the nearest deposits in that direction being about thirty miles distant along Redwater Creek, and the veins cropping out at short intervals throughout the Powder River and Yellowstone regions. Nearly all the locations which have thus far been made have recently been pooled or consolidated, and are now owned by the 'Black Hills Consolidated Coal Mining and Fire-clay Manufacturing Company.' Nearly three thousand acres of valuable coal lands are thus under the control of one corporation. The vein in the best developed mine is over five feet thick, lying horizontally between fine beds of fire-clay, and is already penetrated by a tunnel or incline for a distance of nearly two hundred feet. The coal is a very excellent bituminous kind, almost totally free from sulphur and burns to light white ashes without a cinder. It is now being used in an iron and brass foundry here with excellent results.

"Twenty miles northeast of Deadwood is another deposit of bituminous coal, seeming a little harder than the above and already traced one fourth of a mile in a vein five feet thick. Good wagon roads lead to these deposits and a charter has already been obtained for a narrow-gauge railroad from Deadwood to the Redwater mines. A party of experienced coal-miners, representing capital from your vicinity, are now here negotiating for interests in the Redwater property, and I understand have about concluded their bargain.

"These coal measures are of far more importance to this region than many now imagine. As already noted, our timber is fast disappearing. Besides the almost marvelous building enterprises, which have used up some 12,000,000 feet of native lumber during the past year, hundreds of mines and tunnels are being heavily timbered, many miles of fences are being constructed and thousands of cords of wood consumed weekly in the many quartz mills and by individuals. It is estimated that 200 cords of wood are consumed per day in the quartz mills near Deadwood alone, that building operations will be more extensive this year than last, and that the prominent mines have scarcely commenced to utilize the forests as they soon will. Considering that the timbered portion of the Black Hills is only about fifty miles wide and sixty long, and that it is two hundred miles to any other considerable body of timber, we can readily see that the question of fuel supply is very important.

"Under the present expensive system of wagon transportation, coal can not be laid down at Deadwood for less than $8.50 per ton. As wood costs an average of $4 per cord and experiments demonstrate that one ton of this coal is equal to four cords of the soft wood, there is still a speculation in it to haul it thirty-five miles with ox teams. It is safe to say that any company controlling these coal mines and a narrow-gauge railroad to them, will have one of the best paying enterprises in the western country.

BURNING COAL BEDS.

"Along the little Missouri River, about one hundred miles distant, a terrible fire has raged in the coal deposits for years, until immense caverns have been formed where the vast wealth of lignite once existed. At one point where this burning still continues in the interior of a large bluff we were led to think of the infernal ever-boiling lake of fire about which there has been so much difference of opinion of late. It was indeed a terrible sight to witness the broad sheets of flames as they melted away the very vitals of mountains and honey-combed the interior of the earth."

MONTANA.

THE BELMONT GOLD MINE.

Of this mine the Helena *Independent* of the 16th ult. says:

"Next to the famous Penobscot, the Belmont Gold Mine is the richest and best developed in the Stemple district. The vein is wide and rich, uncovered for hundreds of feet, and the ore easily worked. Such a mine alone, it is asserted by competent miners, would render a district valuable and fill the surrounding hills with eager prospectors, but located in the same district with that marvel of richness, the Penobscot, it naturally occupies a second place to that richest of mines.

"Yesterday afternoon Capt. Wm. B. Frue and Mr. Nates S. Vestel purchased a three quarter interest in the mine at rate of $50,000, Mr. Vestel already owning a quarter interest, which gives the gentlemen the entire mine.

"The mine is to be vigorously worked; the present 10-stamp mill will be pulled down and an addition of ten stamps added.

"This will, it is thought, be of sufficient capacity for the present summer's business, but it is the intention, so soon as the mine is opened, to erect at least a 50-stamp mill, should the outlook continue as good as at present.

"The machinery has been ordered by telegraph, and grading for the new mill will immediately begin, and the building be ready for the machinery, which is expected to arrive in six weeks. An automatic tramway will also be built to convey rock from the mine to the mill. The new mill will have a capacity of about thirty tons per day, and will cost in the neighborhood of $30,000. It is estimated that ore can be treated at a cost of $1.50 per ton of rock, the mining of which will not exceed $2.

"The Belmont mine is situated about two miles from, and in a direct line with, the Penobscot, and is generally regarded as an extension of that famous lead. The mine is situated on a steep mountain, no shaft being sunk, but it is most thoroughly prospected by four tunnels, run in at different depths, and being driven from 60 to 250 feet, all of which show good ore. The upper levels have a slate formation for wall rock, but the lower one, which is driven in a distance of 120 feet, shows a width of vein varying from eight to twelve feet, carrying higher grade ore than any of the levels above, and its walls are of solid granite formation. The lower level will expose 400 feet of the vein, from which no hoisting or pumping will be necessary—that is, they will stope to the surface and send the ore in shutes to the lower level, which of itself will doubtless pay the purchase money of the mine."

THE PENOBSCOT GOLD MINE.

A correspondent of the Butte *Miner* of the 16th inst. says:

"The lode in this mine strikes from southwest to northeast; is fifteen feet thick and pitches toward the northwest, at an angle of about 8 degrees with the perpendicular. It occurs on the line of junction of a slate with a granite formation; with slate toward the south, or foot-wall. An 8 × 15 foot shaft has been sunk to the depth of 85 feet, where a level toward the east extends for 35 feet. Below the main shaft, a small prospect shaft is down 20 feet deeper, following the hanging wall. Several cross-cuts, run from different depths while sinking the shaft, prove the lead to be of the uniform thickness of 15 feet, and reveal its walls going down without the least break and truly parallel to each other. The ledge is of quartz throughout, no horses of granite or other waste rock having yet been encountered. In color it is black, looking very much like the manganese silver ore of Butte, but is interspersed with globular masses and serpentine streaks of yellow ore. Along the hanging wall a vein, eight or ten inches wide, of gray ore is so rich that gold can readily be detected in almost every part of it by the naked eye.

"The level running east follows the hanging wall, which continues smooth and unbroken for about twenty feet from the shaft, but at that distance becomes undulating, striking forward into the lode, and again withdrawing beyond the plane of its average course. From the eastern end of the level a cross drift was run to the foot-wall, when the ledge was found to be of the same width and of the same high grade ore as at the shaft. Shaft and level together yielded about $80,000. At this rate the ore between the level and the surface must contain about $140,000. In the explorations now being conducted at a greater depth, the same fabulous wealth is found, while toward the west, where ore equal to any yet found in the mine is to be seen, the lode has not yet been prospected by a level."

A recent run of 85 tons of ore from this mine yielded thirty-four pounds of gold—this since the casting of the $60,000 bar. It is estimated that the present loss in working equals 25 per cent of the assay value.

Speaking of the various mines in the vicinity of the Penobscot, the same correspondent observes: "At the head of Dog Creek the main divide curves in the form of an S. The first shaft opened upon the lode on which the Snow Drift, Penobscot, Black Hawk, and Grey Eagle are different locations, was upon the exact summit of the divide separating Lewis and Clark from Deer Lodge County. This discovery shaft is between the Snow Drift and Penobscot claims, and occupies such a position upon the curving divide that from it we follow the lode east into Deer Lodge County, and west into Lewis and Clark. The town of Vestel is but a few hundred feet distant from the Penobscot Shaft, and is built just within the belt of timber starting at that point, and extending toward the valley, the divide upon each side of the summit being bare of trees.

"At Mount Pleasant and vicinity are several mines, which will add largely to Montana's treasure shipments as soon as reduction works are provided. Upon Comb's Gulch, a mile and a half from town, a mill will be built this summer to work ore from the Whippoorwill, Little Giant, and Northern Light—three very good mines belonging to one company. The owners of the Blue Bird, a valuable mine upon the hill back of town, will also build a mill some time this year. The Belmont already has a water-mill of ten stamps, but at present it is idle for lack of sufficient water. It will soon be worked by steam, an engine having been ordered from the East. Besides these, the Mount Pleasant, Little Emma, and Emma Miller have been opened and shown to be valuable mines.

"The town of Mount Pleasant has a more favorable site than Vestel, and is a larger village, although building is going on more rapidly in the latter place. From their great elevation and difficulty of access the work of development has been retarded in these mines, but a very brief visit will convince any one that the camps at the head of Silver Creek are to be numbered among Montana's richest and best."

NEVADA.

THE COMSTOCK.

We condense the following from the mining summary in the *Gold Hill News* of May 22d:

"Julia is in a comparatively quiescent state just at present, but will not remain so long. The flood of water at the 2000 level is reduced to complete subjection, and as soon as some little timbering preparations are gone through with, cross-cutting east will be resumed to develop the true inwardness of the good ore prospects indicated by the diamond drill sent ahead at that point. The drill certainly is an advantageous arrangement in this case, as it not only gives some idea as to what the ore prospects are ahead, but operates as a safeguard against sudden surprise in the shape of any heavy and detrimental flood of water which might be encountered. Judiciously employed, the diamond drill is an advantageous appliance in mining.

"Savage is in the doldrums, so to speak, with nothing in its present condition

and prospects to warrant any fitful excitement. The main drift east at the 1640 level, to intercept the Sutro Tunnel, and explore the eastern portion of the Savage ground, is pushing ahead. It has passed through the recently-discovered ore vein, and is now running in the usual porphyry and quartz vein matter of the Comstock. The drifts north and south in the west wall of the vein aforesaid are being continued toward other eligible points for cross-cutting. The drift on the 2100 level has not reached the vein.

"The winze below the 1900 level of the Ophir still continues downward, the entire size of the winze in good ore, and has but a few feet further to go to reach the 2000 level, when a drift will be started back westward to meet and connect with the east drift on that level.

"The new quartz discovery on the 2000 level of the Sierra Nevada, although of a very encouraging character, has not as yet developed paying ore.

"There are no changes in either the Consolidated Virginia or the California to warrant the steady depreciation of those stocks. The same amount of ore is being extracted, the same mills run, and there are no apparent differences in either the looks of the stopes or the quality of the ore extracted. On the 1950 level the east drift has advanced to within 100 feet of the C. & C. shaft, the face still being in perfectly dry ground, while the bottom of the shaft is yet flooded with a small river of water. This shows conclusively that there must be a heavy clay separation impervious to the water somewhere between where the 1950 station is now being opened in the shaft and the face of this drift.

"The Sutro Tunnel continues its rate of advance toward the heart of the Comstock, and must be near the eastern border of the Savage ground. The header is in regular Comstock vein matter, hot and dry, and the drift on the 1640 level of the Savage, which is advancing to meet it, will soon assist in solving the Sutro Tunnel problem. This work has advanced, up to the 21st inst., 19,689 feet.

"Assessments are quite numerous on the mines of the north end, and some few are being levied on the south end. Caledonia, for instance, has just levied one of 50 cents per share."

THE EUREKA CONSOLIDATED.

A recent letter from the Superintendent concerning the condition of this mine is given below:

"The ore bodies on the 7th, 8th, 9th, 10th, and 11th levels continue to look well. The ore extracted during the past week shows a decided improvement in the assay value.

"The 5th level drift has been advanced 21 feet in hard rock. The 7th level, west drift, has advanced 11 feet in favorable looking ground for ore. In the east drift on this level we have raised 21 feet in low grade ore, and have started a new upraise near intersection with cross-cut.

"The winze from the east drift on the 8th level has been sunk 10 feet in fair ore, and a drift started from the bottom in good ore.

"The incline from the 9th level has been sunk 19 feet. The ground is dry and favorable for sinking.

"We will complete the station at the 11th level next week.

"The west drift from cross-cut No. 2, on the 9th level, has been run 13 feet in very favorable ground for ore. The east drift on this level has been run 19 feet in broken and stained rock. The west drift from cross-cut No. 1 has been run 15 feet through broken limestone.

"Only three furnaces have been in operation, and have produced the usual amount of bullion to each furnace. Started up No. 2 furnace yesterday. The Gerrish copper furnace lasted only four days. I am rebuilding it with sandstone, and will have it running again next week."

ELKO COUNTY MINES.

The Tuscarora *Times-Review* says: "There has been a fine body of ore struck in the south drift of the Hornet mine, forty feet from the main shaft. There is a streak of six inches that assays regularly from $1200 to $1300, and two feet or more that will work $200 and upward. The ore body as far as developed, looks as though it would prove extensive, and we have every reason to believe the discovery will inure immensely to the advantage of the district by encouraging the development of a number of mines in that vicinity which are now lying idle.

"There is a three and a half foot ledge at the depth of twenty-eight feet in the Huguenot claim. Some pieces of ore taken from the bottom of the incline yesterday assayed respectively $93, $204, $378 in silver.

"It is rumored that work on the Cornucopia Consolidated mine will soon be started up. Also, that several other mines in Cornucopia District will commence operations in a short time."

UTAH.

The Superintendent of the Ontario Silver Mining Company, in his report for the week ending May 21st, says:

"The mine is looking as well as usual throughout the stopes. The 500-foot level is still being pushed east in ore. The upraise in the west drift is still developing a large body of good ore. The new shaft is progressing favorably."

NOTES.

STEEL RAILS IN FRANCE.—In 1877 the railway companies of France were purchasers of iron rails to the extent of 48,888 tons, while 136,549 tons of steel rails were required. A comparison with the corresponding figures of 1876 (57,936 tons of iron and 130,681 tons of steel rails) shows a notable decrease in the consumption of iron rails, and a corresponding increase in the consumption of steel rails.—*Engineering.*

EXTENSIVE IRON FAILURE.—Messrs. Kimberly, Carnes & Co., one of the largest iron firms of Western Pennsylvania, with works located at Newcastle, Greenville, Sharon, and other points in the Shenandoah Valley, failed on the 28th ult. The immediate cause of failure was the inability to procure discounts, one hundred thousand dollars' worth of their paper having gone to protest on Saturday. The liabilities and assets can not be ascertained until after the creditors meet.

RESISTANCE OF IRON TO REPEATED BLOWS.—Giambattista Biadego publishes a note upon the determination of the strains which iron can sustain, with special reference to Wöhler's experiments upon the effects of repeated blows. He recounts the experiments of Fairbairn (1849-61), Wöhler (1859-70), and Spangenberg; the analytical discussions of Gerber (1872), Launhardt (1873), Weyrauch (1877), and Winkler (1877); and some deductions of his own; giving a preference to the formulæ of Launhardt, as improved by Weyrauch—*Il Politecnico.*

TELEPHONIC TRANSFORMATIONS.—M. A. Demoget, of Nantes, estimates that only about $\frac{1}{100}$ of the sound which is communicated to the telephone is transmitted to the receiver. He considers that the muscular effort of the speaker is transformed: 1, into vibrations of the air; 2, into metallic vibrations; 3, into magnetic waves; 4, into electric induction; 5, into magnetic induction; 6, into metallic vibrations; 7, into vibrations of the air; 8, into vibrations of the auditory apparatus. If we suppose the loss of useful effect at each transformation to be equal, the loss would be comprised between $\frac{3}{8}$ and $\frac{1}{2}$. This represents, very nearly, the experimental efficiency of pumps.—*Les Mondes.*

MICROSCOPIC MINERALOGY.—A. Michel Lévy has contributed to the *Annales des Mines* a valuable paper upon the use of the polarizing microscope, for the determination of mineral species by small sections. The investigations of Rosenbusch, Fouqué, and Descloiseux, although all embraced within the last decade, have already become classical. Lévy tabulates their conclusions, and gives a complete mathematical analysis of the angles of extinction presented by the sections of a zone, together with a practical application to the study of the principal monoclinic minerals, and of some triclinic feldspars.

HIGH FURNACES.—M. L. Greever divides smelting furnaces into two classes, which he calls *trapu* (squat), and *elancé* (long). In the trapu, the height does not exceed three times the length; in the elancé, the ratio is four or more; and he admits an intermediate class, the *ordinaire*, in which the ratio is between three and four, and generally about 3·5. He compares the productions of various furnaces in England, Styria, Carinthia, America, Sweden, Germany, and France, drawing conclusions unfavorable to the elancés, which have increased so largely within the last quarter of a century.—*Annales des Mines.*

EARTH DEPRESSION IN FRANCE.—A little village in the neighborhood of Draguignan, France, has, says *Nature*, lately been the scene of a remarkable subsidence which has attracted the curious from all directions. An elliptical tract of ground, containing over 10,000 square feet, sank gradually one day, accompanied by loud noises, until it left an orifice of over 100 feet in depth, with water at the bottom. Numerous tree and vines disappeared completely in the depths of the new lake. A similar depression on a smaller scale occurred in the same vicinity a century ago, and both the phenomena are attributed to the action of subterranean streams.—*Engineer.*

LONDON WATER-WORKS.—Nearly all the water-works companies of the metropolis are actively engaged in providing a constant water supply, and the number of miles of streets which now contain mains constantly charged and upon which hydrants for fire purposes could at once be fixed, in each district of the metropolis, is given in Mr. Frank Bolton's report for the month of March as follows: Kent, 80 miles; New River, 196; East London, 85; Southwark and Vauxhall, 112½; West Middlesex, 70; Grand Junction, 41½; Lambeth, 70; Chelsea, 56, making a total length of 711 miles, the water companies are ready to affix hydrants thereon when required by the authorities. The total number of hydrants erected is at present 4527, of which 2813 are for private purposes, 542 for street watering 697 for public use, and 475 in Government establishments.—*Engineer.*

ANTHRACITE COAL IN FRANCE.—The introduction of this great staple of commerce is an accident of the Exhibition, and, if successful, will soon compensate the United States for all expenses incurred in sending goods to Paris. Mr. Edward A. Quintard, who represents the Reading Railroad Company, in bringing over a 40-ton railway engine for the Exhibition, freighted a vessel with anthracite coal, which is being purchased in Havre at good prices by the French iron manufacturers for experiment in their furnaces. Of the result of the experiment there can be no doubt; the superiority of anthracite in blast-furnaces is well known in America, and it has only to be known in Europe to create an unlimited demand for an inexhaustible American product. This opens a new commercial prospect of inestimable importance, which will make Reading stock "buoyant," and also the spirits of the American coal men. France will want millions of tons per annum.—*American Advertiser, Paris.*

COAL IN NEW ZEALAND.—Coal seams of considerable thickness are being worked at several places in New Zealand; in the North Island at Kawakawa, Bay of Islands, and Waikato; in the Southern Island at the Gray River, Mount Rochfort, Green Island, and the Clutha Valley, in the province of Otago, and also in Southland, mining of brown coal, or lignite, deposits of which are scattered over all parts of the colony, though not likely, except in a few instances, to support such large mining communities as the black coal, will yet afford, in time, extensive employment. In heat-generating properties it is reported to be equal to the coal raised at the Newcastle pits in New South Wales. As a natural product derived from the decomposition of coal seams, it is proper to mention the occurrence of petroleum or rock oil springs in various parts of the colony, particularly at Taranaki, on the west coast, and in the vicinity of Poverty Bay, near the East Cape, in the North Island. The quality of the petroleum in the latter place is quite equal to that obtained in Canada or the United States.—*Engineering.*

M. BREQUET'S EXPERIMENTS WITH THE TELEPHONE.—In a note to the French Academy, M. Brequet says that all the points of the telephone—the handle, the binding screws, the shell, etc., as well as the plate, may enable one to hear sounds. He demonstrates this with the string telephone. Attaching the string to any point of the Bell telephone, and using the parchment membrane, one may easily correspond with a person using a Bell telephone. Thus, by attaching several string telephones to a Bell telephone, several persons may hear the messages simultaneously. To render string telephones more practically useful, M. Brequet fixes to the center of the membrane two or several strings meeting there at an angle. The sound carried by one of them is propagated by all the others. A thread is also passed through the centers of membranes, which then serve as supports for long, straight lines. A sort of relay is also formed by means of a brass cylinder with two membranes, to which strings are connected. This method of extending the string telephone has been in use in this country for the past three years.

COMPOUND LOCOMOTIVES.—M. Mallet has presented a communication to the French Academy, on the application of the compound system to locomotives on the railroad from Bayonne to Biarritz. The engine has two cranks, at right angles, driven by two cylinders, one on each side. They have a range of 0·45 m., the diameter of one being 0·24 m., the other 0·40 m. Under ordinary circumstances, the steam from the boiler passes first into the small cylinder, then into the large, where it acts expansively, and finally escapes into the chimney. But on starting, and whenever the engine is required to surmount an increased resistance, the steam may be admitted directly into the large cylinder, and the locomotive acts as an ordinary two-cylinder engine. The plan has been adopted in three engines, with four coupled wheels of 1·20 m. in diameter; the boiler has 45 square meters of heating surface, and acts with an effective pressure of 10 kg. per square centimeter. They are employed in local traffic, on grades of 0·015. Their action is unexceptionable, their steadiness leaving nothing to desire, even at a speed of 40km per hour, and the management being no more difficult than in ordinary engines. The draught, notwithstanding the reduction of the steam-jets to one half, is ample, so that the boiler, in spite of the small dimensions, supplies the wants of the engine abundantly. As for the consumption of fuel, the cost per kilometer is 4 kg. of Cardiff coal for trains weighing 50, 60, or even 70 tons. The foregoing facts are derived from a service of 40,000 km., performed since the system was adopted. They have, therefore, an important practical value.—*Ann. des Ponts et Chaussées.*

SEWAGE AT HERTFORD.—The corporation of Hertford have placed their works for the purification of the sewage of that town in the hands of the Rivers Purification Association, who, for an annual subsidy of £350, undertake the whole management of the place, as they have already done at Coventry, which they have successfully worked for some time under a subsidy from the corporation. Hertford is situated on the River Lea, from whence the New River Company derives its supply. The average daily flow of sewage amounts to about 1,640,000 gallons, the population being 7169. Water-closets are in general use, and the sewage, which is very dilute in consequence of leakage of subsoil waters into the sewers, also contains refuse from breweries. By an Act passed in 1854, the New River Company obtained powers to lay down intercepting main sewers through the town, to construct works for treating the sewage by the lime process, and to convey the effluent water past the New River head into the Lea above the town of Ware. These sewage and outlet works cost the New River Company £28,000, and they pay the corporation of Hertford £600 a year to purify the sewage. For sixteen years, from 1858 until 1875, the lime process was used to purify the sewage, at a working cost of £410 a year, and was then given up, as the Phosphate Sewage company took a lease of the sewage works, paying £100 a year rental, and receiving £300 a year for the treatment of the sewage, until lately, when the corporation, as aforesaid, placed their works in the hands of the association referred to, whose offices are at 7 Westminster Chambers.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative statement for the week ending May 25, and years from January 1:

TONS OF 2240 LB.	1878.		1877.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co..	23,631	763,283	49,691	845,510
D. L. & W. RR. Co.	39,116	660.529	49,057	836,010
Penn. Coal Co.....	35,922	226,489	18,517	387,489
L. V. RR. Co.....	14,581	278,011	14,984	389,223
P. & N. Y. RR. Co..	213	9,593	1,262	19,285
C. RR. of N. J.....	13,256	310,563	38,729	579,567
Penn. Canal Co....	6,842	63,346	14,372	92,393
	133,561	2,311,814	186,612	3,149,477
Lehigh Region.				
L. V. RR. Co.....	33,610	793,684	91,971	1,133,205
C. RR. of N. J....	28,709	405,365	33,868	575,161
D. H. & W. B. RR..	626	8,123	101	6,298
	62,945	1,207,172	125,940	1,714,664
Schuylkill Region.				
P. & R. RR. Co	2,493	1,371,549	171,154	2,157,473
Shamokin & Lykens Val.....	20,517	218,772	9,844	205,433
	23,010	1,590,321	180.998	2,362,906
Sullivan Region.				
Sul. & Erie RR. Co.	843	12,120	86	4,843
Total.....	220,359	5,121,427	493,636	7,231,890
Increase.....	.....	.....	.....	.....
Decrease.....	273,277	2,110,463	.....	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

Coals Cleared on the Canals of the State of New York for the week ending May 22d, and years from the opening of navigation:

Tons of 2,000 lbs.	1878.		1877.	
	Week.	Year.	Week.	Year.
Anthracite.....	24,915	37,036	37,148	125,965
Bituminous.....	5,740	11,379	8,985	27,117
Total amount cleared	30,655	48,415	46,133	153,082

Receipts and shipments of coal at Chicago Ill., for the week ending May 25, and year from January 1.

	Week. Tons.	Year Tons.
Receipts.....	52,357	500,731
Shipments.....	2,165	69,737

Belvidere Delaware Railroad Report for week ending May 25

	Week.	Year. 1878.	Year. 1877.
Coal for shipment at Coal Port (Trenton).....	162	380	8,230
Coal for shipment at South Amboy	11,315	183,928	261,152
Coal for distribution.....	3,280	63,856	70,790
Coal for Company's use.....	923	31,847	32,071

Receipts of Coal at Boston, for the week ending May 24 and years from January 1:

TONS OF 2240 LB.	1878.		1877.	
	Week.	Year.	Week.	Year.
From Alexandria and Georgetown.....	416	5,776	380	8,188
Philadelphia.....	12,647	162,147	16,496	180,354
Baltimore.....	1,690	47,348	2,936	41,042
Other places.....	2,129	87,132	4,380	87,145
Great Britain.....	.....	13,425	.....	1,197
Nova Scotia.....	535	2,937	421	4,090
Total.....	17,417	318,765	24,613	322,016

The receipts of coal at Rondout, N. Y., by the Delaware & Hudson Canal for the five days ending May 29 were 149 boats, carrying 18,918 tons.

The shipments of coal at Cleveland, Ohio, for the week ending May 26 were as follows: Shipped coastwise, 7,454 tons; total for year, 45,322 tons; foreign shipments, 4,911 tons; total for year, 20,198. Total of coastwise and foreign shipments for week, 12,365; for year. 65,520.

Perth Amboy Business:	Tons.
Received for the week..	5,309
Shipped for the week.....	19,487
On hand May 25.....	43,962

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania Railroads amounts to 32,527 tons as compared with the corresponding period in 1877.

The Production of Bituminous Coal for the week ending May 25, was as follows:

Tons of 2,000 lb., unless otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2,240 lb.....	39,984	458,850
Barclay Region, Pa.		
Barclay R. R., tons of 2,240 lbs.....	5,608	120,549
Broad Top Region, Pa.		
Huntingdon and Broad Top R. R.....	1,882	53,576
*East Broad Top.....	1,106	26,017
Clearfield Region, Pa.		
*Snow Shoe.....	580	11,366
*Tyrone and Clearfield.....	21,573	447,384
Allegheny Region, Pa.		
*Pennsylvania R. R	3,603	75,741
Pittsburgh Region, Pa.		
*West Penn R. R.....	3,518	81,599
*Southwest Penn. R. R.....	446	10,965
*Penn & Westmoreland gas coal, Pa. R. R.....	9,914	278,983
*Pennsylvania R. R.....	12,190	156,065

*For the week ending May 21.

The Production of Coke for the week ending May 21:

Tons of 2000 lbs.	Week.	Year.
West Penn R. R.....	2,355	30,895
Southwest Penn. R. R.....	14,010	300,377
Penn. & Westmoreland Region, Pa. R. R.	1,583	24,922
Pittsburg, Penn. R. R.....	2,337	34,850
Total.....	20,285	391,044

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 31, 1878.

Anthracite.

On Wednesday the regular monthly sale of the Delaware, Lackawanna & Western R. R. Co. took place at 26 Exchange Place in this city. According to previous announcement, 50,000 tons were offered for sale divided as follows, and for which the following average prices were received, comparison being made with the previous sale:

		May 29.	May 1.
5,000	tons steamboat	$3.42½	$3.30½
10,000	" grate	3.45	3.30
10,000	" egg	3.56	3.45
20,000	" stove	3.75	3.77
5,000	" chestnut	3.25	3.15
50,000	"	$3.59	$3.49

It will be observed that the prices secured at the last sale are 10c. per ton higher in the average than those of May 1. But to those present it was also observed that prices were bolstered, whether to enable the Delaware, Lackawanna & Western R. R. Co. to move its coal at an advance or to aid some of the other companies to do the same thing, is not certain. Perhaps through these sales the company may dispose of, to parties interested in sustaining prices, a considerable quantity of their production, but it is certain that all large buyers have for a considerable time looked upon them as in no way expressing the true state of trade. If what is known as the "limited" production of all the companies was offered at auction a much different range of prices would be shown, for with the difficulty there is in giving the appearance of brisk bidding to the small quantities now offered, in the larger it would become one of the greatest farces ever perpetrated upon the public.

In the Philadelphia market there has been, in comparison, a better business than here, although most of the dealers spoke of more inquiry previous to the sale, which they attributed to the announcement that prices for June would be advanced. Yesterday being a holiday, and to-day being too late for those who desire to avoid the higher prices which they are supposed to pay, beginning with to-morrow; the market has had no opportunity to make known its true condition. It is very evident, however, that buyers are well aware that they are to receive an abundant supply of coal during June, and with this anticipation they are not apt to be too anxious in making purchases.

The production of anthracite coal last week was 220,359 tons, as against 391,387 tons the previous week, and 493,636 tons the corresponding week of 1877. The total production from January 1st to May 25th was 5,121,427 tons, as compared with 7,231,890 tons for the like period of last year, showing a falling off this year of 2,110,463 tons.

Bituminous.

The only feature to this coal is that there is a fair incidental business doing, and that the trade lost during the reign of low prices of anthracite coal is slowly coming back. We hear of quite a number of instances where Eastern manufacturers are beginning to take bituminous coal again.

New York.

Wholesale Prices of Anthracite Coal for June Delivery f. o. b. at Tide Water Shipping Ports, per ton of 2,240 lbs.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
WYOMING COAL.	$	$	$	$	$	$
Lackawana, at Weehawken	3 60	3 60	3 60	3 75	4 10	3 50
*Pittston, at Newburg.....	3 45	3 45	3 45	3 60	3 95	3 40
L. Val. Coal Co., at Amboy.	3 75	3 50	3 50	3 60	3 90	3 25
Kingston at Hoboken.....	3 50	3 50	3 60	3 75	4 10	3 50
LEHIGH COAL.						
L. V. Coal Co., at P. Amboy.	.....	.....	3 75	3 75	3 90	3 25
Mount Pleasant, at Hobok'n	.....	.....	3 75	3 75	3 90	3 25
Hazleton, at Hoboken....	.....	.....	3 75	3 75	3 90	3 25
Cross Creek, at Port John.	4 00	.....	3 75	3 75	3 90	3 25
SCHUYLKILL COAL *at Pt. Richmond, Phila.*						
Hard White Ash.	3 30	3 30	3 30	3 45	3 75	3 25
Free-burning W. Ash.	.....	.....	3 25	3 40	3 75	3 15
Schuylkill Red Ash.....	.....	.....	.....	3 60	3 75	3 15
Lorberry.....	.....	.....	3 70	3 75	3 75	.....
Lykens Valley Vein.....	.....	.....	3 70	3 85	3 85	.....

* Fifty cents per ton additional for delivery in New York.

Wholesale Prices of Bituminous Coal.

DOMESTIC GAS COALS.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn.....	$4 25	.....
At Greenwich, Philadelphia		$5 50
At S. Amboy.	5 00	5 50
Kanawha at Richmond	4 10	5 40
Red Bank Cannel, Pa., at Philadelphia..	8 00	8 50
Youghiogheny, Waverly Co., at Balt ...	4 00	5 65
Despard, West Va.....	4 50	6 00
Murphy Run, West Va., at Baltimore...	3 75	5 85
Fairmount, West Va., " " ...	3 75	5 70
Newburg Orrel. Md. " " ...	3 75	6 00
Cannelton Cannel, West Va	.....	10 00
" Splint " at Richmond.	6 00	7 00
" Gas Coal at Richmond	4 00	5 65
Peytona Cannel, W. Va.. at Richmond...		10 00

MANUFACTURING AND STEAM COALS.

Cumberland at Georgetown and Alexandria	2 75@2 90	4 35@4 50
Cumberland, at Baltimore.....	2 90@3 00	4 35@4 50
Cl'rfi'd "Eureka" and "Franklin."		
At mines.....	0 75	....
At Baltimore.....	3 25	4 50
At Philadelphia.....	3 25	4 50

FOREIGN GAS COALS.

	Sterling.	Am. cur'ncy.
Newcastle, at Newcastle-on Tyne.....	7s.6d.	$2 50@ $3 50
Liv. House Orrel, at Liv.....	25s.	13 00
Ince Hall Cannel "	35s.6d.	18 00
" Gas Cannel "	25s.6d.	10 00@ 10 50
Scotch Gas Cannel, at Glasgow, nominal.....	25s.	7 50
	Gold.	
Bl'k House, at Cow Bay, N.S.	$1 75	$4 50
Caledonia, at Pt. Caledonia.	1 50	4 25
Glace Bay at Glace Bay....	1 50	4 00
Lingan, at Lingan Bay.....	1 50	....
Intern'l Mines, at Sydney...	1 75	4 50
Pictou, Vale Mines, at Pictou	2 00	4 70

Retail Prices.

Per ton of 2000 lbs.

Anthracite.

	G. & Egg.	Stove	Chest'
Pittston coal delivered.....	$5 00	$5 00	$5 00
Lack. coal, delivered below 59th St.	4 50	4 50	4 50
Wilkes-Barre, delivered	4 50	4 50	4 50
Lehigh and Locust Mount. del'd	5 00	5 00	4 75

Bituminous.

Liv. House Orrel.....	$18 00	American Orrel.....	$11 00
Liv. House Cannel...	18 00	Red Bank Cannel.....	7 00
Am. "	11 00	Cumberland... ..	9 00
Ca'n'lt'n Bl'k, or splint.	10 00		

Cincinnati, O. May 28, 1878.

[Specially reported by the Consolidated Coal & Mining Co.]

Per bushel of 72 lbs.

	Retail delivered.	Wholesale afloat.
Youghiogheny.....	11c.	7½c.
Camden.....	9c.	5½c.
Cannel.....	17@18c.	13c.

Anthracite, delivered, $7@$8 per ton of 2,000 lbs.

Chicago, Ill. May 28, 1878.

[Specially reported by Messrs. RENO & LITTLE.]

Retail prices of coal delivered per ton of 2,000 lb.

Lackawanna Stove	$5.75	Erie and Brier Hill.....	$5.00
" Chestnut ..	5.25	Wilm'gton & Ill.	$3 00@3.50
" Grate :....	5.50	Blossburg.....	5.50
" Egg.....	5.25	Piedmont.....	6.50

Hamilton, Ont. May 27, 1878.

[Specially reported by H. BARNARD.]

Retail prices delivered per ton of 2,000 lb.

Scr. or Wilkes-B. Grate.	$5 00	Lehigh Lump.....	$6 00
" " Egg ..	5 00	Brier Hill.....	5 50
" " Stove.	5 25	Massillon	4 50
" " Nut ..	5 25	Smithing.....	5 50

Montreal. May 27, 1878.

[Specially reported by Messrs. ROBERT C. ADAMS & Co.]

Wholesale per 2,240 lb.

Scotch Steam.....	$4 75	Cape Breton Steam...	$4 25
Pictou.....	4 50	Newcastle Smith's....	6 00

Anthracite at retail, per 2,000 lb. delivered.

Stove.....	$6 50	Chestnut.....	$6 00
Egg.....	6 00		

Pittsburg, Pa.

May 30, 1878.

The most noticeable transaction of the week was a sale ordered by the Coal Exchange of sixty barge loads of coal, at Cincinnati, at 6 cents a bushel, in order to settle a disorganizer, who was selling below the concerted rates, which this sale did effectually. The whole quantity in the sixty barges at 12,000 bushels each, was 720,000, or 27,692 tons. Since that sale the price stands as before in Cincinnati. The resumption of mining is not general here, owing to the lower markets being all glutted, which makes it a matter of indifference about immediate provision for further supplies; besides, a large portion of the coal boats are still loaded with unsold coal at their places of destination, and the principal part of those that have been discharged and returned have been reloaded with coal at the mines, and are now prepared to go down on the first flood. A general apathy characterizes the business, and those interested in it are leisurely repairing their floating craft and putting their mines in order for an active resumption of the trade this fall. There is some discontent among the miners at the pay for their work—2½ cents a bushel—though it is not likely to culminate in a strike. A little calculation on the general reduced prices of all commodities, proves that as much can be bought with the 2½ cents as was with the 5 cents paid during the period of inflation. Quotations unchanged.

PRICES AT PITTSBURG.

Wholesale, on board....	5	cts. per bush....	$1.30 per ton.
Retail, delivered.....	7	cts. "	1.84 "

AT CINCINNATI.

Wholesale, on board...	7¾	cts. per bush....	$2.04 per ton.
Retail, delivered	10¾	cts "	2.83 "

AT LOUISVILLE.

Wholesale, on board....	8	cts. per bush....	$2.11 per ton.
Retail, delivered.....	10¾	cts. "	2.83 "

AT NEW ORLEANS.

Wholesale, on board....35 cts. per bbl....$3.44 per ton.
Retail, delivered.....45 cts. " .... 4.42 "

Bushels are rated among dealers here at 76 lbs.—26⅓ bushels make a ton, nearly.

The barrel that rules the coal measurement in New Orleans contains 2 4-7 bushels of 80 lbs. each, making about 206 lbs. Nine and two thirds of these barrels weigh a ton within a small fraction.

COKE.—Nothing new has transpired in this business—it is still characterized by a steady demand and a steady production. Should an increase in the demand take place, the producers are ready to meet it, to any considerable extent. Competition and the necessities of business have brought down prices to a margin that can scarcely be called a living one, without practicing the strictest economy. There is no change in price. We give quotations of home rates, in which 40 lb. make a bushel and 50 bushels a ton:

Wholesale, per bushel, 4c.@4½c.; per ton, $2.00@$2.25.
Retail, " 5c.@5½c.; " $2.50@$2.75.

The prices at other points where the Connellsville coke goes are the same as here with the transportion added.—*American Manufacturer.*

Pittston, Pa. May 27, 1878.

Pennsylvania Coal Company's Coal in Yard.
Retail per ton of 2,000 lb.

Lump, Egg, and Stove	$2 25
Chestnut	2 00
Pea	1 00

Delivered, 50 cents per ton additional.

San Francisco, Cal. May 23, 1878.

COAL.—Imports from January 1st to May 1st, 1878:

	Tons.		Tons.
Anthracite	4,436	Vancouver Island	42,644
Australian	12,390	Seattle	23,361
Coos Bay	7,852	English	14,076
Cumberland	349	Mt. Diablo	23,040
Bellingham Bay	2,300		

The arrivals from Pacific Coast mines and from British Columbia continue to be very liberal, giving us full supplies and at low prices. We neglected to state in our last week's issue that the cargo of Wallsend per Rajah, 1648 tons, sold at or about $7. This is the spot price at date, but for cargoes of same to arrive we think an offer of $6 would be accepted. The imports for the week include: 390 tons Sydney, per Sea Waif; Hazard, 510 tons Wellington; Don Nicolas, 1600 tons Nanaimo; Belvedere, 2050 tons Naniamo; Gussie Telfair, 325 tons Coos Bay; Clara Light, 250 tons Coos Bay; Western Shore, 2100 tons Seattle; North Star, 615 tons Seattle; Levi Stevens, 820 tons Seattle. We quote coast screenings for steam purposes $4@4.50; dito coarse, screened, $5@6; British Columbia is held somewhat higher. California of the Empire Mine is retailing at $6, delivered; Seattle, $8. Of course the low rates for an abundant supply of near by Pacific coals has a demoraling effact upon all foreign supplies both here and to arrive, the quotations of which it is hard to state with any degree of reliability. The Anthracite Coal fields of Sonora are attracting much attention. Their extent is not yet ascertained. Nine thousand acres are already located by one man. This coal has 90 per cent of pure carbon and is without a trace of sulphur. It contains but a small quantity of silex. Its ash is white and feathery. This discovery will be of great value to California and of great importance to Arizona. Gen. Rosecrans is interested in these mines, and capitalists are talking of running a railroad to the mines. California, if we are to rely on the many indications, will, at no distant day, have an abundant supply of cheap fuel.—*Commercial Bulletin.*

FREIGHTS.

Ocean Freights.

Ocean Freights on coal, iron, etc., per ton of 2000 lb., to and from foreign and domestic ports, for three weeks ending May 30th, 1878, are given below.

DATE.	From	To	Cargo.	R'te
May 8	New York	Belfast, Ireland	Slate	*26
" 8	Baltimore	St. Thomas, W.I.	Coal	2.50
" 8	Ragged Island	New York	Salt†	10
" 13	Philadelphia	St. Jago, Cuba	Coal	2.25
" 13	Georgetown	" "	"	2.50
" 15	Philadelphia	Genoa, Italy	"	4.00
" 15	Rondout	Zaza	"	1.95
" 15	Turk's Isle, Bahamas	Providence	Salt†	08
" 18	Philadelphia	St. Thomas, W.I.	Coal	2.50
" 18	Almeria, Spain	New York	Iron Ore	*8
" 21	Philadelphia	Cardenas, Cuba	Coal	1.00
" 21	Baltimore	St. Jago, Cuba	"	2.50
" 23	New York	Bremen, Ger.	Slate	*26
" 27	Philadelphia	Aspinwall, C.A.	Coal	3.75
" 27	Philadelphia	St. Pierre, W. I.	Coal	2.00
" 27	Elizabethport	Sackville, N. B.	Coal	1.75

*Shillings. † Per bushel.

Lake Freights on Coal and Iron Ore.

Representing the latest actual charters up to the 28th inst

From	To	Rate per ton.	From	To	Rate per ton.
Cleveland.	Chicago	40	Ashtabula	Milwaukee	40
"	Buffalo	35	"	Chicago	35
"	Toronto*	1.00	Buffalo	Detroit§	25
"	Milwaukee	40	Oswego	Chicago	80
"	Detour	40	"	Milwaukee	60
"	Sh'boyg'n	50	"	Detroit	45
Marquette	Cleveland†	1.30	Charlotte	Milwaukee	65
"	Ashtab'la†	1.40	Buffalo	Portage	50
Black Riv.	Buffalo	35	Cleveland.	Ogdensb'g	1.30
Fairport	Milwau'ee	35	"	Prescott	1.25
Black Riv.	Blk. Rock.	45	Blk. River	Buffalo	35
"	Chicago	40	Kincardi'e	Chicago*	60
Buffalo	"	30	E.Sagin'w	"	¶08
"	Detroit	20	F'r Haven	"	80
"	Milwau'ee	30	Buffalo	Cleveland	†40

*Gold. † Iron ore. ‡ Six trips coal and six trips ore. § Pig iron. ‖ Gold and return cargo, ore. Ogdensburg to Cleveland, 50c., free on board. ¶ Salt free on board.

CLEVELAND, O., May 25, 1878.

Coal to Chicago 35@40c. Vessels are scarce at these prices. It is said that many large vessels are going into ordinary on arrival at Buffalo, preferring rather to stop for a while than to run at such low rates.

The first shipment of coal from Toledo to a foreign port was made on the 18th inst. The schooner White Oak left here, bound for Toronto, with 380 tons of coal, which she took on at the Columbus and Toledo Dock. This shipment—the first of 30,000 tons, which will be taken over during the present season—is made by the firm of Hacket & Walsh, of Detroit, through their Toledo agent, Mr. C. Darfinger.

Coastwise Freights.

Per ton of 2,240 lb.

Representing the latest actual charters to May 31, 1878.

PORTS.	From Philadelphia.	From Baltimore.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	1.25†@1.25†		
Albany		1.60	
Alexandria, Va			
Annapolis			
Brooklyn, N. Y	85		
Bangor, Me	1.10	1.45	
Bath, Me		1.30	90
Baltimore	40†@45†		
Boston, Mass	1.10@1.20	1.30	80@90
Bridgeport, Conn.	85@90†	1.25	50
Bristol, R. I			80
Beverly, Mass			80@90
Buffalo			
Cambridge, Mass.			80@90
Cambr'g p't, Mass			
Charleston	80†		
East Cambridge	1.30		
Fall River		1.25	70
Gardner, Me			
Georgetown, D.C.			
Gloucester	92@1.13†		
Hartford, Conn	1.40	1.75	
Hoboken			35
Hudson, N. Y		1.35	
Jersey City			35
Lynn			
Medford	1.55		
Middletown			90
Nantucket, Mass.			90
Newark, N. J.		1.30	
New Bedford	1.10	1.30	80
Newburyport		1.45	1.00
New Haven	90†	1.25	50
New London		1.25	50
Newport			70
New York		1.20	35
New Orleans, La.			
Norfolk, Va			
Norwich		1.45	65
Norwalk, Conn		1.30	55
Pawtucket		1.35	
Philadelphia		65	
Portland	90@1.05†	1.25	80
Portsmouth, N.H.		1.30	90
Providence	1.10	1.25	70
Richmond, Va	55		
Rockland	1.30		
Roxbury	1.32½		
Salem, Mass		1.35	80@90
Southport	85†		
Somerset, Mass			75
Trenton	40†	1.00	
Troy		1.60	
Washington	55@60		
Wareham		1.30	
Wilmington, Del.		65	

*And discharging and towing. † And discharging. ‡ And towing. § 3c. per bridge extra.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 31, 1878.

American Pig.—There are numerous sales spoken of, but particulars are kept private. The business of this week has been more quiet than that of the previous one, and prices are no better, but, if any thing, still weakening. With financial trouble expected to come to some of the furnace companies, and the belief that all are losing money at the present prices of iron, coupled with the feeling that we are likely to have, as for several years past, a quiet trade during June and July, the outlook is exceedingly discouraging. It would be thought that many furnaces would blow out under this condition of affairs, but those who are strong believe that others must go into bankruptcy soon, and that such as do will have to stop production, after which prices will react, while the weaker ones know that to stop now means to stop until their companies are completely reorganized. We quote No. 1 foundry, $16.50@$18; No. 2 foundry, $15.50@$17, and forge, $14.50@$16.

Scotch Pig.—In this there continues to be only a retail business. The following are the nominal quotations: Eglinton, $22.50; Coltness, $24.50; and Glengarnock, $23.50.

Rails.—We only learn of a sale of 10,000 tons of steel for delivery during year to the Southern Pacific road on private terms. As none of the mills are in a position to sell for prompt delivery, such a quotation is but quite nominal. For fall delivery, the prices are about $42@$44 at mill, according to location. Iron rails are very quiet. We quote at $32@$36 at mill.

Old Rails.—A sale of 500 tons at $17.50 is reported. This figure about represents the market price.

Wrought Scrap.—We are reported a sale of 200 tons on private terms, and quote at $20@$21.

Baltimore, Md. May 27, 1878.

[Specially reported by Messrs. R. C. HOFFMAN & Co.]

The iron market shows no improvement, and only for best brands are prices maintained, at about following rates:

Balt. Char.	$28.00@$29.00	M. & White	$14.00@$15.00
Va. "	27.00@ 29.00	C'lC.B.	Blooms 50.00@ 52.00
Anth. No. 1	19.00@ 20.00	" "	Billetts 52.00@ 55.00
" " 2	18.00@ 19.00	Refi'd	Blooms 45.00@ 50.00
" " 3	17.00@ 18.00		

Cincinnati, O. May 28, 1878.

[Specially reported by Messrs. TRABER & AUBERY, Commission Merchants for the sale of pig iron, blooms, ore, etc.]

Below please find closing quotations of our pig iron market, viz.:

CHARCOAL.

H'n'g Rock	No. 1 Foundry & B	$21 00@	$22 50—4 mos.
" "	No. 2 "	20 00@	21 00—4 mos.
" "	Soft Silver Gray	19 00@	20 00—4 mos.
" "	Mill	18 00@	19 00—4 mos.
Tennessee	No. 1 Foundry	21 00@	—4 mos.
" "	No. 2 "	20 00@	—4 mos.
" "	Mill	18 00@	19 00—4 mos.

STONE COAL.

Ohio	No. 1 Foundry	$19 00@	—4 mos.
"	No. 2 "	18 00@	—4 mos.
"	Nos. 3 and 4 "	17 00@	18 00—4 mos.
"	Mill	17 00@	—4 mos.

COKE.

Ohio & W. Va.	No. 1 Foundry	19 00@	20 00—4 mos
" "	No. 2 "	18 00@	—4 mos
" "	Mill	17 00@	—4 mos

CAR-WHEEL.

H'n'g R., C. B	Hecla, Vesuvius, Etna, Jefferson.	$36 00@	—4 mos.
Maryland, "	Cedar Point	35 00@	—4 mos.
Missouri, "	Maramec	30 00@	—4 mos.

BLOOMS.

Charcoal	$45 00@$50 00—cash.

SCRAP IRON.

Cast	40c. @ 45c.—cash.
Wrought	62½c.@ $1.00—cash

Demand fair at the quotations.

Columbus, Ohio. May 27, 1878.

[Specially reported by Messrs. KING, GILBERT & WARNER, Dealers in Pig Iron and Ores.]

The demand for pig-iron during the past week has been rather limited, with no improvement in prices. We quote as follows:

FOUNDRY IRONS.

No. 1 Hanging Rock Charcoal	$23 50@$24 00
No. 2 " " "	22 00@ 22 50
No. 1 Hocking Valley soft and strong from pure limestone ores	20 00@ 20 50
No. 2 Hocking Valley soft and strong from pure limestone ores	19 00@ 19 50
No. 1 American Scotch	19 00@ 19 50
No. 1 Moxahala	20 00@ 20 50
No. 2 "	19 00@ 19 50
No. 1 Shawnee	19 50@ 20 00
No. 1 Eliza (Jackson County)	19 00@ 19 50
Silver Gray	17 50@ 18 00

MILL IRONS.

Gray neutral	18 00@ 18 50
Mottled and white neutral	17 00@ 17 50
Gray cold short	17 00@ 17 50
Mottled and white cold short	16 00@ 16 50

Chattanooga, Tenn. May 27, 1878.

[Specially reported by J. F. JAMES, Dealer in Iron & Metals.]

Tenn., Ala. & Ga.	Charcoal, No. 1 Foundry	$18 00@$19 00
Tenn., Ala. & Ga.	Charcoal, No. 2 Foundry	17 00@ 18 00
Tenn., Ala. & Ga.	Charcoal, Gray Forge	15 00@ 16 00
Tenn., Ala. & Ga.	Coke, No. 1 Foundry	19 00@ 20 00
Tenn., Ala. & Ga.	Coke, No. 2 Foundry	17 00@ 18 00
Tenn., Ala. & Ga.	Coke, Gray Forge	15 00@ 16 00
Tenn., Ala. & Ga.	cld B. (car-wheel)	20 00@ 28 00
Charcoal or Coke, white and mottled		14 00@ 15 00

Old rails	$18 00@$19 00	Wr'ght scrap, No. 2	$12 00
Old car wh'ls	16 00@ 17 00	Cast scrap	10 00
Wr'ght scrap, No. 1	17 00	Muck bar	32 00@ 33 00

Cleveland, O. May 27, 1878.

[Specially reported by Messrs. C. E. BINGHAM & Co.]

Per gross ton, on four months' time. Subject to change without notice.

FOUNDRY IRON.

No. 1 L. S. Charcoal	$24 00	Am. S., No. 1, Ch. Val.	$22 00
No. 2 " "	24 00	" " B—1, " "	21 00
No. 1 Anthracite	21 00	" " No. 2 " "	19 00
No. 2 "	19 00	No. 1, Massillon	22 00
No. 1 Bituminous	21 00	B—1, "	21 00
No. 2 "	19 00	No. 2, "	20 00

CAR-WHEEL AND MALLEABLE IRON.

No. 3, L. S. Charcoal	$25 00	Nos. 5 & 6, L. S. Char.	$25 00
No 4, " "	25 00		

BESSEMER IRON.

Nos. 1 & 2, L. S. Char	$24 00

FORGE IRON.

No. 1, Gray	$18 00	White and Mottled	$17 00

Iron Ores.

Red Hematite (about 55 per cent. metallic iron) f. o. c. at mines	$1 25
Brown Hematite (about 55 per cent. metallic iron)	1 75

Louisville, Ky. May 27, 1878.

[Specially reported by Messrs. GEORGE H. HULL & Co.]

The demand for all grades is light, and prices are without change.

The usual time, 4 months, allowed on quotations below:

FOUNDRY IRONS.

	No. 1.	No. 2.
Hanging Rock Charcoal	$21 00@$22 00	$18 00@$20 00
Southern Charcoal	18 50@ 19 00	17 50@ 18 00
H'n'g Rock, Stc'l & Coke	19 00@ 20 00	18 00@ 19 00
Southern Stonecoal & Coke	18 00@ 19 00	17 00@ 18 00
"Amer. Scotch"	$19@$20 | Silver Gray	$16@$17.50

MILL IRONS.

No. 1 Charcoal, Cold-short & Neutral	$16 00@$17 00
No. 1 Stc'l & Coke, Cold-short & Neutral	16 00@ 16 50
No. 2 Stc'l & Coke, Cold-short & Neutral	@ 16 00
No. 1 Missouri and Indiana, Red-short	20 00@ 21 00
White & Mottled, Cold-short & Neutral	14 00@ 15 00

CAR-WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold Blast	$32 00@$34 00
Alabama and Georgia, Cold Blast	25 00@ 31 00
Kentucky, Cold Blast	25 00@ 30 00

Richmond, Va. May 28, 1878.

[Specially reported by ASA SNYDER, Esq.]

The demand for iron is very light. But for the small quantity in stocks and light receipts, this market would be depressed. I quote nominally as below:

Amer. Scotch Pig Iron			$23.00@$24.00
Anthracite	" "	No. 1	19.50@ 20.50
"	" "	No. 2	18.50@ 19.50
"	" "	No. 3	17.50@ 18.50
"	" "	Mottled	15.00@ 16.00
Coke	"	No. 1	21.00@ .....
"	" "	No. 2	20.00@ .....
Va. Cold Blast Charcoal Pig Iron, cold short			20.00@ 24.00
" " "	" "	neutral	28.00@ 29.00
" Warm	" "	"cold short	19.00@ 22.00
" " "	" "	" red short silver grey	18 00@ 19 00
Old Rails			16.00@ 17.00
Wrought scrap No. 1			18.00@ 19.00
Cast scrap—Machinery			17.00@ .....
Richmond Refined Bar Iron			2.00@ 2.25
Horse-shoes			4.50@ 4.75
Mule-shoes			5.75@ . ..
Old Dominion nails (standard size)			2.60 keg.

St. Louis, Mo. May 28, 1878.

[Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.]

No perceptible change is noticed in the condition of our market since last report. Demand continues light and prices unchanged. Old rails are plenty and prices low.

COLD BLAST CHARCOAL—ALL NUMBERS.

Hanging Rock	$25@$34	Assorted Bar Iron	$2, rates.
Tennessee	26@ 30	No. 1 Wr'ght Scarp,	80c. cwt.
Kentucky	25@ 30	Heavy cast "	65c. "
Missouri	26@ 28	Light "	55c. "
Georgia	24@ 26	Old rails	$20 00@$20 50
Alabama	24@ 26	Old carwheels	17 00@ 18 00

	No. 1.	No. 2.	Mill.	White and Mottl'd
Missouri stone coal	$22 00	$22 00	$19 00	$16 00
" charcoal	20 00	19 00	18 50	17 00
Tennessee charcoal	22 00	21 00	19 00	17 00
Tenn. coke very soft and strong	21 00	20 00	19 00	17 50
Hanging Rock charcoal	25 00	24 00	.....	.....
" " cold short	22 00	21 00	.....	.....
	ExNo.1	No. 1.	BNo.1.	No. 2.
Alice Hanging Rock coke	$24 00	$23 00	$22 50	$21 50
Quinnimount, W.Va., coke	24 00	22 50	21 50	20 50

METALS.

NEW YORK, Friday Evening, May 31, 1878.

Outside of tin plates the metal market has been as quiet as for weeks past, with a downward tendency in the prices of nearly all articles.

RECEIPTS OF METALS AT NEW YORK FOR THE FOUR WEEKS ENDING MAY 30, AND YEAR FROM JANUARY 1, 1878.

	May 9	May 16	May 23.	May 30	Yr. from Jan. 1.
Copper, bbls	125	206	594	174	5,043
Copper, boxes	.....	....	.....	.....	113
Copper, cakes	.....	...	1,602	474	5,347
Lead, pigs	3,689	8,476	2,040	2,007	148,554
Spelter, pieces	2,680	...	531	1,687	23,334
Quicksil'r, flasks	.....	....	25	200	533

Gold Coin.—During the week under review the price of gold has ranged from 100⅞ to 101¼ and closed at 101.

Bullion.—Silver continues nominal and weak in London at 53¼d., the lowest figure for some time past, and the rate here is made lower by the decline in Sterling Exchange. At 116¼ here the market is steady for the time being. Gold is quoted at par to ⅛ per cent premium.

An important matter, although perhaps not bearing upon the immediate future of the silver market, is the probable development of silver and other mines in China. The Chinese Government realizes that other industries must be established to give employment to its vast population. Veins of rich silver ore have been discovered, and arrangements will probably soon be made with one of our prominent Western mining engineers to go to China, where he will be furnished with money and labor to develop the mines. Should it be found that that country has even moderately rich silver ores, with the abundance of cheap labor it may in but a few years have a very important bearing upon the silver markets of the world.

DATE.	London Pence.	N. Y. Cents.	DATE.	London Pence.	N. Y. Cents.
May 25	53¼	116¾	May 29.	53¼	116¼
May 27	53¼	116¾	May 30.	53 5-16	.....
May 28	53¼	116⅛	May 31.	53¼	116¼

The Carson Mint Operations for May.—The Carson *Appeal* of the 24th inst. says: 'The coinage of standard silver dollars up to the present time, for this month, is $623,000. The total eastern shipment of the same coin, covering the same period, has been $550,000. Yesterday two transfer orders were received at the Carson Mint for the shipment of $100,000 in standard dollars to St. Louis, Missouri, each order covering $50,000. The Secretary of the Treasury expects this Mint to turn out at least $400,000 next month, which will be done, provided, of course, the material is furnished in the shape of bullion."

The Actual Circulation of the Silver Dollars.—A correspondent of the *Evening Post*, writing from Washington, under date of May 29th, says: "While nearly six millions of silver standard dollars have been coined since the passage of the Silver law, not one million have gone into circulation.

"The annexed table, showing the workings of the Silver law up to the close of business yesterday in the Treasury Department, furnishes food for reflection for those advocates of the silver dollar who were so loud in their assertion that the people demanded 'the dollar of their fathers:'

TREASURER'S OFFICE,
TREASURY DEPARTMENT, May 28, 1878.

Standard silver dollars:	
On hand	$5,187,533
Paid out for currency	470,468
Exchanged for gold	215,598
Paid out for silver bullion	99,169
Total coin	$5,972,768
Silver certificates—total issue	342,040
Received back	313,140
Actually in circulation	$28,900

"Secretary Sherman at first directed that the standard dollars should only be paid out for gold, but this did not diminish the amount of silver in the treasury very much. An order was then issued directing the assistant treasurers to pay out silver dollars for legal-tender notes, in the expectation that the former would get into general circulation. It was soon found that this failed to accomplish the object in view, and that nearly every silver dollar paid out came back into the Treasury to pay customs duties. The order was thereupon rescinded.

"Secretary Sherman, up to this time, has not found a way to issue the two millions of standard dollars coined each month, but is confident that he will succeed in doing so. In a conversation with your correspondent to-day he said: 'We will not issue them at the center of trade, where they are returned for customs duties, but will distribute them throughout the country. I can't say exactly how this will be done, but the amount authorized by law will be put out.'"

The Bureau of Engraving and Printing has delivered to the Treasury $19,260,000 of silver certificates, and is engagaged in completing the order.

BULLION SHIPMENTS.

May 20.	Modoc,	Nevada	$9,167.66
" 20.	Hussey,	"	*3,024.00
" 17.	Tybo Con.,	"	21,262.34
" 17.	Justice,	"	6,600.00
" 16.	Raymond and Ely,	"	8,657.84
" 19.	Northern Belle,	"	10,140.87
" 22.	Manhattan,	"	14,800.00
" 18.	California,	"	132,543.49
" 18.	Con. Virginia,	"	57,440.63
" 17.	Grand Prize,	"	†46,400.00
" 11.	Tiptop,	Arizona	6,657.75
" 18.	McCracken,	"	30,000.00
" 11.	Stonewall Jackson,	"	100,000.00
" 20.	Gila,	"	7,266.40
" 20.	Hackberry,	"	18,190.55
" 18.	Independence,	California	16,800.00
" 21.	Christy,	Utah	5,454.00
" 31.	Ontario,	"	‡116,676.60

* Total April bullion product, $22,200.
† " " " 92,100.
‡ Production for past 24 days of May.

ARIZONA SHIPMENTS.—During the thirty days from April 15th to May 15th, there has been shipped from Prescott to San Francisco, one hundred thousand dollars in gold and silver bullion. The amount will increase very materially so soon as other mills are started up, which are now under course of construction. The yield of bullion for the whole territory during the thirty days ending with May 15th will aggregate about $350,000. This is considered fair when taken into consideration that but few quartz mills are in operation as yet.

Copper.—We are only reported sales of 150,000 lbs. at 16¼@16½c., which is about as close as we can arrive at quotations for to-day. Chili bars are quoted in London at £64 10s., the whole London market having risen £3 or £3. For several years the price of copper has had a downward tendency with occasional spurts upward. The indications still point the same way. The production will probably be more this year than last, while the consumption so far has been less, with no indications that lost ground can be recovered during the balance of the year.

Tin.—Business in this article has been quiet. We quote in gold, per box, as follows: Straits, 14¼@14⅝c.; L. & F., 14¼c.; Refined, 14¼c. Straits in London is quoted at £62 5s.@£62 10s. Singapore quotes $18.20, and Penang $17.62½, with exchange at 3s. 11⅜d.

Tin Plates.—These have been the feature of the metal market this week, the arrangement for a curtailment of make by the manufacturers in England being the basis of an advance in prices and a resumption of active business. There was a business of 3000 boxes of roofing, and large sales for future delivery to Western houses, since when, the market has fallen off a shade. We quote, in gold, per box, as follows: Charcoal tins, $6@$6.12½, and ternes, $5.50; coke tins, $5@$5.12½, and ternes, $5.

Messrs. Robert Crooks & Co., of Liverpool, under date of May 16, say of tin and terne plates:

"The combination is still to arrange. A meeting takes place to-day, at which it is expected a definite understanding will be come to, but it is generally believed that it will not be possible to get more than one fifth stoppage agreed to. Prices show no improvement on the week, nor is there any change for the worse. Generally Charcoal Tins are steady, at prices quoted; Ternes easier in one or two cases. Coke Tins, B. V. grade, 15s.; poorer quality, 14s. 9d. @ 14s. 6d. Coke Ternes, 14s. @ 14s. 3d."

Lead.—A sale of about 600 tons of refined lead is reported to have been made at 3¼c. for future delivery. In ordinary we learn of no business worthy of note, and quote nominally at 3¼c. We note a recent shipment of 21 car loads of lead from Utah to San Francisco, for shipment to Japan. The San Francisco *Commercial Herald* of May 23 reports shipments of lead from that port as follows: The Gaelic, for China, 619,173 lbs., and the Alaska, for New York, 711,150 lbs.

Spelter and Zinc are without business worthy of note. We quote the former at 4¾c., and the latter at 6c.

Antimony.—We quote Hallett's at 12c. and Cookson's at 12¾c.

Quicksilver.—The San Francisco *Commercial Herald* of May 23d says: The market continues quiet. During this month the bonanza kings bought 1000 flasks (irregular and small-sized bottles) upon private terms. Otherwise some 2500 flasks sold at 41½c. for export. The price for local use is 42c. The Gaelic for Hong Kong carried 1265 flasks, and to Japan 5 flasks.

Salt Lake Ore and Metal Market.

SALT LAKE CITY, Utah, May 24, 1878.

Argentiferous Lead (Base Bullion), $31 per ton for lead; $1.15 per ounce for silver; $20 per ounce for gold. The quotations for silver are based upon the silver in the lead of 80 to 120 ounces per ton of 2000 lb.

The *Inter-Ocean's* correspondent, under date of the 20th inst., reports the following:

"Shipments for the week ending May 11th: 43 cars bullion to Omaha, 30 to Pittsburg, 13 cars lead to San Francisco, 1 car lead ore to Omaha. Bullion, 1,539,541 lbs.; lead, 274,520 lbs.; lead ore, 22,000 lbs.; total, 1,836,061 lbs.

"For the week ending May 18th; 14 cars bullion to Pittsburg, 18 to Omaha, 8 cars lead to San Francisco, 2 cars lead ore to Omaha. Bullion, 678,930 lbs.; lead, 168,092 lbs.; lead ore, 42,000 lbs.; total, 889,022 lbs.

"The last sales of bullion were $27.50 per ton for lead, and $1.15 per ounce for silver. This is the lowest price lead ever touched in this market. The lead shipped to San Francisco is for Japan."

We note recent shipments of ore from San Francisco as follows: 495,994 lbs. of copper ore to Liverpool and 1,555 lbs. of silver ore to New York.

The Hecla Smelting Works of Butte, Montana, have on hand ready for shipment 224,000 lbs. of copper *matte* in sacks, and 70,000 lbs. unsacked. Seventy-five tons of crude bullion is awaiting transportation to the terminus of the U. N. R. R.

The Butte *Miner* says: "The small cupola has just completed a run of ten days, during which time it turned out 100,000 lbs. bullion. The large furnace will soon start up on Atlantic ore, of which there is enough on hand for a ten days' run. In that time it is estimated that 2,000,000 lbs. crude bullion will be turned out."

FINANCIAL.

New York Stocks.

NEW YORK, Friday Evening, May 31, 1878.

Coal shares are advancing and a decidedly increased business is manifested; the total sales for this week amount to about 112,000 shares, of which Delaware, Lackawanna & Western R. R. contributes 91,610 shares, the stock closing at 56⅜ against 55 a week ago. We record sales of 7000 shares in the stock of the Delaware & Hudson Co., at prices ranging from 55 to 56¼, closing at 56, an advance of one per cent on the quotations of a week ago. The feature of the week is the advance, principally to-day, in the stock of the New Jersey Central, which closes at 25⅝, against 21⅜ last week; the highest price attained to-day was 26⅛; the transactions aggregate 14,412 shares.

Lehigh & Wilkes-Barre Coal Co.—A special meeting of the stockholders of this company will be held June 11, at its office, in the office of the Lehigh Coal & Navigation Co., for the purpose of electing a President and six directors, to serve until the next annual election.

Petroleum Storage Co.—The annual meeting of the stockholders of this company will take place June 3.

Volcanic Oil & Coal Co.—A dividend of 25 cents per share, payable on and after June 1, has been declared on the stock of this company.

Cumberland Coal & Iron Co.—The annual meeting of this company, for the election of a president and Board of Directors, will be held June 3.

Ulster & Delaware R. R. Co.—The annual meeting of the stockholders of this road will be held in Rondout, N. Y., June 12.

The Rome, Watertown & Ogdensburg R. R. Co.—Will hold its annual meeting for the election of directors June 3d.

Reading & Lehigh R. R. Co.—In view of the proceedings begun to foreclose the mortgage on this road, the stockholders recently held an informal meeting and decided to combine and buy in the road in case of a sale in order to prevent its purchase by the Philadelphia and R. R., which now leases it.

Lehigh & Lackawanna R. R. Co.—Track is reported laid on the extension of this road from the late terminus at Chapman, Pa., northwest to the Wind Gap, 10 miles. From the Wind Gap to Stoudsburg, 10 miles further; the work is well advanced, and it is expected that trains will be running by July 4th.

Potomac, Fredericksburg & Piedmont R. R.—A circular from this company announces that on May 13th it resumed sole control of the railroad recently operated by the Royal Land Company. Its general offices will be at Fredericksburg, Va.

This road was originally the Fredericksburg & Gordonsville; track was laid upon it from Fredericksburg west 18 miles, several years ago, but not operated. In 1876 the Royal Land Company acquired possession, changed the gauge to three feet, and extended it to Orange Court House, making it 38 miles long. The reasons for the present transfer are not stated.

Bellefontaine & Northwestern R. R. Co.—This company has been organized to build a narrow-gauge road from Bellefontaine, O., northwest by way of Wapakoneta and Van Wert, to the Indiana line in Van Wert County. The distance is about 70 miles.

Utica, Ithaca and Elmira Railroad.—Articles of association have just been forwarded to Albany for the re-organization of this company. The capital is placed at two million dollars, 20,000 shares of $100 each, all of which have been subscribed and paid for. The largest shareholders are George James Rice, of England, and English capitalists represented by him. The following have been elected officers of the new corporation which under its re-organization will be known as the Utica, Ithaca and Elmira Railway Company: President, G. James Rice; Vice-President and General Manager, Joseph Rodbourn; Secretary, David S. Greenough; Treasurer, M. W. Serat.

COUPONS on the following bonds fall due during the present month:

Delaware, Lackawanna & Western R. R. Co.—Conv. bonds; coupons.

Milwaukee Iron Co.—Coupons due.

Mineral Range R. R. Co.—Coupons.

Morris & Essex R. R. Co.—Cons. mortgage; coupons paid by Del., Lack. & Western R. R. Co.

Rockland Nickel Mining Co.—Coupons.

St. Louis & Iron Mountain R. R. Co.—Coupons.

Syracuse, Binghamton & New York R. R. Co.—Coupons paid by Del., Lack. & W. R. R. Co.

Tennessee Coal & R. R. Co.—Coupons.

Philadelphia Stocks.

PHILADELPHIA, Friday Evening, May 31, 1878.

A very active market has characterized the dealings in the coal shares at the Philadelphia Board during the week just closed, the total sales reaching 120,000 shares. With the exception of a marked advance in Reading the changes in the quotations do not call for special comment. The stock of the Pennsylvania R. R. Co. has changed hands to the extent of 94,000 shares, the final price showing a slight advance. Lehigh Valley R. R. stock exhibits a slight improvement, with sales of 2000 shares. Lehigh Coal and Navigation is weaker, with sales amounting to 5487 shares. About 19,000 shares of Reading have changed hands at from 13⅞ to 15⅝, closing at the latter price, which shows an advance equal to nearly 4 per cent on our quotation last week.

AUCTION SALES.—*Schuylkill Navigation Co.*—500 shares at from $6.25@$6.62 per share.

Cambria Iron Co.—725 shares at $53.25 per share.

Schuylkill Navigation Co.—$3000, loan of 1832, 6 per cent @ 83 per cent.

Wilmington & Reading R. R. Co.—$1400 2d mortgage 7 per cent bonds, coupons on from January, 1874, inclusive; 75c. for lot.

Thomas Iron Co.—38 shares, par $50@$20 per share.

Philadelphia & Reading R. R. Co.—$2000 debenture 6 per cent bonds; coupons on from July, 1877, at 38 per cent.

COUPONS AND INTEREST on the following bonds will fall due during the present month.

Camden & Amboy R. R.—Cons. mort. loan coupons paid by Penn. R. R. Co.

Colebrookdale R. R.—1st mort. coupons paid by Phila. & Reading R. R. Co.

Dunbar Iron Co.—Coupons.

Lehigh Coal & Navigation Co.—6 per cent gold loan; coupons cons. mortgage loan & conv. loan; interest.

Lehigh Valley R. R.—1st and cons. mortgage bonds and 7 per cent bonds of Penn. & N. Y. Canal & R. R. Co.; coupons.

Pennsylvania & New York Canal & R. R. Co.—7 per cent bonds; coupons.

Pennsylvania R. R. Co.—Cons., mort. and coupon bonds; coupons and interest.

Philadelphia & Reading R. R. Co.—Consolidated mortgage loan; registered interest and coupons.

Philadelphia & Reading Coal & Iron Co.—Registered interest and coupons; paid by Philadelphia & Reading R. R. Co.

South Mountain Iron R. R.—First-mortgage bonds; coupons.

United New Jersey Transportation Co.—Loan of 1889; coupons paid by Pennsylvania R. R. Co.

Copper Stocks.

Reported by WILSON W. FAY & CO., Brokers in Mining and Miscellaneous Stocks, Room 7, Traveller Building, 31 State street

BOSTON, Wednesday Evening, May 29, 1878.

The market has been dull through the week and closes this evening remarkably quiet, even for the day before a holiday.

The quiet market does not reign on the copper stocks alone, but also on the rest of the stocks, which, although more active than the "coppers," are still more quiet than they have been for the past few months, and the market generally shows a disposition to decline.

Calumet & Hecla has sold up to 180, and closes firm at 179@180.

Copper Falls has declined to $1 bid and $1¼ asked, and no sales, and is quiet, there being little disposition to trade.

Franklin is rather weak at $4⅞@5¼, and sales at $5.

Osceola remains quiet and unchanged to any extent.

Pewabic is also unchanged at $1½@1¾, there being a sale of 50 at $1⅞.

Quincy closes at 15 bid and 16 asked.

Ridge closes at $1@1¼.

Duncan has been lively, advancing to $2⅞ and $3, but has declined to $2¾, and closes rather weak at $2½@2¾.

International sold up to $45, but has also declined, and closes at $35@40.

Miscellaneous Stocks and Quotations.

Sales and quotations of the stocks and bonds dealt in here, at Philadelphia and Baltimore for the week ending the 31st inst are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.	Par Value.	High'st	Lowest	Closing	Sales: Shares.
American Coal Co.	$25	.....	.....	28	.....
St.L.,I.M.& S.R.Co..	100	6½	6½	6½	70
Spring Mt. Coal Co.	50	.....	.....	50	.....
*Cambria Iron Co..	50	.....	.....	55	.....
*Penn.Salt Mf'g Co.	50	.....	.....	65	.....
*Westm'land C. Co.	50	.....	.....	61¾	.....
*Buck Mt. Coal Co..	50	.....	.....	35	.....
*Schuyl. Nav. Co...	50	.....	.....	.....	.....
†B.&O.RR.Co.1st pf	.....	.....	.....	96	.....
†B.&O.RR.Co.2d pf	100	.....	.....	84	.....
" " " com	100	.....	.....	75	.....
†George's C'k C. Co	100	.....	.....	85	.....
†S. Clara M'g Co...	100	.....	.....	25c.	.....
†Atlantic Coal Co.	10	.....	.....	91c.	.....

BONDS.	Princ'l. When Due.	Int'est. When Due.	Hig'st.	Lowest	Amount.
D., L. & W., 7s, conv	1892	J. & D.	.....	.....	.....
" " " " 2d mtge.	1881	M. & S.	105½	.....	$2,000
N.J.C.,1stmtge.new	1890	F. & A.	.....	.....	.....
" " " 1st mtge.,con	1899	Q.	81½	79½	*36,000
" " " convt.....	1902	M. & N.	77¾	77	14,000
Lehigh & W. B., con	1899	Q.	46½	44	30,000
Am. Dock & Imp. 7s	.....	J. & J.	50	40	17,000
St.L.I.M.& S..1st mt	1892	F. & A.	109¾	109	19,000
Ches. & O., 1st mtge	1899	M. & N.	33½	29¾	11,000
D & H C Co.,1stm.rg	1884	J. & J.	.....	.....	.....
" " " " " "	1891	J. & J.	103	92½	24,000
" " " m.loan cp	1894	A. & O.	100	.....	5,000
" " " " rg.	1894	A. & O.	102½	100	11,000
" " " " new mge.	.....	.....	.....	.....	.....
*L.V.R.,1stm.6s.cp.	1898	J. & D.	.....	.....	.....
" " " " rg.	1898	J. & D.	.....	.....	.....
" " " 2d m. 7s,rg.	1910	M. & S.	114	.....	4,200
" " " con.m.6s,rg	1823	J. & D.	97	.....	5,000
" " " " 6s cp.	1923	J. & D.	.....	.....	.....
*Pa.RR.,1st m.6s,cp	1880	J. & J.	106½	.....	4,000
" " g. m., 6s, cp.	1910	J. & J.	109	.....	5,000
" " " 6s, rg.	1910	A. & O.	.....	.....	.....
" " con.m.6s,rg.	1905	Q.	.....	.....	.....
" " " 6s, cp.	1905	J. & D.	.....	.....	.....
" " new loan, 5s	.....	.....	111	.....	4,600
*P.& R. R., 1st m.6s, R. C. 43-44.....	1880	J. & J.	...	.....	.....
P. & R. R., 1st m. 6s, R. C. 48-49.....	1880	J. & J	.....	.....	.....
P.& R. R.,2d m. 7s cp	1893	A. & O.	110	.....	2,000
" " " scrip....	1882	J. & J.	51½	.....	1,000
" " " in.m.7s,cp	1896	J. & D.	.....	.....	.....
" " " c.m.7s,cp.	1911	J. & D.	102½	.....	3,000
" " " " 7s, rg.	1911	J. & D.	103	.....	1,000
" " " cvt.7s,R.C	1893	J. & J.	29¾	26	1,417
" " C.& I.Co.,Deb 7s, R. C.....	1892	M. & S.	.....	.....	.....
& R.C.& I. Co., m. 7s, R. C.....	'92-3	various	.....	.....	.....
L. Nav. Co.,6s,rg.m.	1884	J. & J.	103¼	.....	5,300
" " RR., rg. m.	1897	F. & Q.	.....	.....	.....
" " cvt. co. G. R.	1894	M. & S.	.....	.....	.....
" " " Gold R. C.	1897	J. & D.	90	89¼	10,500
" " con.m.7s,rg.	1911	J. & D.	.....	.....	.....
*P.& N.Y.C.,7s,R.C.	1896 1906	J. & D.	113½	.....	1,000
*Pa Canal, 6s, cp..	1910	J. & J.	.....	.....	.....
*Schuyl.Nav.,1st m. 6s. rg.....	1897	M. & O.	.....	.....	.....
*Sus.Coal, 6s, rg...	1911	J. & J.	.....	.....	.....
†Balt.&O. RR., 6s..	1880	J. & J.	.....	.....	.....
" " " 6s..	1885	A. & O.	.....	.....	.....

Total transactions for the week.....$217,017

* $13,000 of the whole were assented, selling at from 68¼ to 71¾.

Gas Stocks.

NEW YORK, Friday Evening, May 31, 1878.

We are without quotations of gas stocks this week, and therefore omit the table of prices.

Increasing Use of the Lowe Process.—The successful operations of the Lowe process, at Baltimore and elsewhere, are inducing some of the older coal companies to adopt it. We understand that among these the Toronto (Can.) and Scranton (Pa.) companies have ordered works erected at once. The Utica Company are rebuilding rapidly, an apparatus sufficient for the supply of that city. We quote these facts as having a peculiar significance.

St. Louis Gas Co.—We note the statement that the Receiver of this company has a large surplus on hand, but he is said not to be keeping up the necessary plant and repairs.

The Gas Question in Brooklyn.—At the last meeting of the Brooklyn Board of Aldermen a contract was given to the New York and New Jersey Globe Gas Light Company to light the lamps in the Eastern District with naphtha gas. The aldermen also ordered the Board of City Works to readvertise for proposals for lighting the lamps in the Western District. Mayor Howell has been urged by the old gas companies, by insurance underwriters and by a number of prominent citizens to veto the resolution. The Mayor intimated that he might do so if the old company agreed to furnish gas for less than the new company, and gave it as his opinion that if the Williamsburg Gas Light Company adopted such a course that the Aldermen would reconsider their action. The Williamsburg Company has agreed to reduce its prices from $28.50 per lamp a year to $20, and from $2.15 to $2 per thousand cubic feet for public buildings. A private meeting of representatives of the old gas companies was held May 29th at the office of the Brooklyn Gas Company. It is understood that the old companies concluded to reduce their prices in the event of the Mayor's vetoing the resolution directing the Board of City Works to readvertise for proposals.

The Gas Question in Pittsburg, Pa.—The *Telegraph* of the 30th inst. says: "At a meeting of the Gas Committee last evening the Clerk was directed to notify the Pittsburg Gas Company that they must furnish gas for one hundred and ten lamps in the old city district, now furnished by the East End Gas Company at $1.32 per thousand, for 75 cents per thousand, or the city will put gasoline lamps in their places. The following statement of the condition of gas appropriations after the first quarter was read by the Clerk:

"East End—Appropriation, $14,000; expended, $4736.06; balance, $9623.94. South Side—Appropriation, $8000; expended, $4287.25; balance, $3,712.75. West Pittsburg—Appropriation, $4500; expenditures, $1737.56; balance, $2762.44."

A Gas Riot at Barcelona, Spain.—LONDON, May 27.—The Madrid dispatch of the *Daily News* says: "There was a stormy debate in the Cortes Saturday in regard to the troubles at Barcelona. It seems that the agitation there grew out of the resistance of the people to a municipal tax on gas, which the gas companies assessed on consumers. Private and public establishments ceased burning gas for 43 evenings, and the shops closed at sunset. Crowds collected in front of the few houses which continued to use gas. The loss of the two gas companies amounts to several thousand dollars daily. The city authorities endeavored to compel the shops to keep open, and the Governor issued a proclamation to that effect. Local journals are fined and suspended for protesting, and 10 are under prosecution. The Minister of the Interior supports the municipal authorities, and the agitation is increasing."

The Moncton (N. B.) Gas Works.—The construction of gas works in this place is to be at once begun by Mr. Perry, of Montreal. A large portion of the iron and fittings for the work is furnished from Montreal.

San Francisco Gas Co.—We note recent sales of this company's stock at $1047⅛ per share.

AUCTION SALES: *Lycoming (Williamsport, Pa.) Gas & Water Co.*—$5,000 ($500 each) of the 2d mortgage 6 per cent bonds of this company at 25 per cent.

Dorchester (Mass.) Gas-Light Co.—11 shares at $100 per share.

Lawrence (Mass.) Gas-Light Co.—18 shares at $135¾ per square.

Lowell (Mass.) Gas-Light Co.—10 shares at $167¾ per share.

Cambridge (Mass.) Gas-Light Co.—75 shares at $135⅛ per share.

South Boston (Mass.) Gas-Light Co.—8 shares at $1.18 per share.

Incorporations: Articles of incorporation have been filed in San Francisco of the Alameda Gas-Light Company and of the Berkeley Gas-Light Company, organized for the purpose of supplying those towns with gas. The capital stock of the two companies are alike, being $300,000, in shares of $100 each.

Gold and Silver Stocks.

NEW YORK, Friday Evening, May 31, 1878.

The business of the week under review has not been so large as the previous one. This, however, is accounted for by the advent of a holiday yesterday. American came forward once more with sales, distributed through the week, amounting to 1400 shares, at $7¼@$6. Small parcels of Consolidated Virginia and California, aggregating 245 shares, have been sold at 18¼@21 for the former and 13⅝@14⅜ for the latter. Hukill records sales of 950 shares at $4.60@$4.65. This company has issued a circular announcing its purchase of the Whale Company's property and mill, thereby giving the Hukill company, as it supposes, 1900 ft. more of the vein it is now working, and in addition thereto placer ground that yielded $3000 worth of gold during March of this year, at a cost of $1100. Concentrating machinery to treat the low grade ores will soon be in operation in the Whale mill. The Hukill mine had upon it a lien which made its stock worthless.

According to our understanding of the position of matters now, the Hukill mine and Whale property are deeded to the Hukill company free of all incumbrance, and about 90,000 shares of the capital stock are held by Messrs. S. V. White and John S. Delano for themselves and for others as trustees, and they now seek to sell 25,000 shares of this stock at $4.50 per share, to reimburse themselves for recent purchases and improvements made.

Moose has again made its appearance in the list, 100 shares having been sold on Tuesday at $4 per share. New York and Colorado records but 200 shares at $1.95 to $1.90. In Ontario the sales aggregate 665 shares at 36½ to 36c. The sales of Plumas amount to 8035 shares at $4.05 to $4.25. This is too large a business by far to be legitimate. American Flag has made another faint effort to keep up a quotation. The sales reported are 800 shares at 9 to 10c. Bertha and Edith has been exceedingly weak, declining from 9c. last Saturday to 5c. on Thursday, recovering to 7c. to-day, with total sales for the week of 108,900. The sales of Buckeye aggregate 2700 shares at 38 to 37c.; the person who does the buying and selling of this stock apparently has a steady view as to its value. Dahlonega has shown more firmness, having advanced from 17 to 20c., with sales of 27,700 shares. Gold Placer has been weaker, declining to 97c. on Wednesday. The sales for the week amount to 1100 shares at $1.10 to .97. King's Mountain records 500 shares as sold at

1.60; Lacrosse, 80,200 shares at 36@31@37c. In Mt. Bross there has been a business of but 300 shares at $1.10.

There is a continued interest growing in mining investments, and each week's operations at the mining exchange represent larger purchases by investors, or, in many cases, speculators who do not expect to make a turn in 3 days on a 5c. margin. Mining prospectuses and representatives of mining properties are appearing from every quarter of the United States.

We have before us the prospectus of the new Philadelphia Silver Mining Co., incorporated under the laws of the State of New York, with a capital stock of $1,500,000, divided into 150,000 shares of $10 each. The property of this company is located in Hot Creek Mining District, Nye County, Nevada, and consists of 1200 feet on the new Philadelphia lode at Rattlesnake Cañon. 20,000 shares are offered for subscription at $1.25 per share, and 5000 shares are held in the treasury as a reserve. It will be seen that the public is invited to invest in this property on the basis of $187,500 for the whole. As the developments amount to only about 80 feet of shaft, and say 70 feet of levels, it is plainly evident that there is not sufficient development to warrant an investment at any thing like the price at which the stock is offered for sale. Those wishing to join in a scheme on the basis of $175,000 can get numerous developed mines that will pay handsome dividends, beyond question.

The Wyandotte Silver Mining Company is out with a prospectus announcing the consolidation of eight lodes in Gilpin County, Col. The property is capitalized at $600,000, divided into 200,000 shares of $3 each.

A third ticket has been presented at the Mining Exchange. This shows some improvements over the two previously issued. The election will take place Monday, June 3d.

The talk of consolidation of all the mines on the Comstock, mentioned in our last, has since been denied by telegraph from San Francisco. The telegram denying it almost indicates that something of the sort may be expected, while private advices still continue to come here that the consolidation will be made.

EDITORIAL CORRESPONDENCE.

Under date of May 27th, our Mr. Rothwell writes us from Denver, as follows:

The American Co.—The American mine has for some time been in poor ore, so poor that according to the statement of men working in it, it did not pay to take out. Work was stopped on the mine and the lower levels filled with water, which it was expected would be taken out by the end of May. The company then proposed sinking the shaft deeper with the hope of finding richer ore.

The Slide Mine of the same company is producing some very fine ore, and is said to be paying some profit. The overestimated valuation put upon the stock of this company, as represented in our report of sales of stock on the Mining Board, can be appreciated by the fact that the Slide, which at the present time, if indeed it was not always, is much the most valuable mine of the two, and it cost, according to current report, $30,000 or $40,000, only a very small proportion—say $4000—of which was cash.

Hukill.—The lower levels of the Hukill were at our last advices filled with water. They are said to contain some good ore. The main level met with porphyry, which cut out all the ore for a long distance, but there is a report circulating that it has recently found ore again. The reserves of ore are probably not so great as has been represented, but the mine is said to do more than pay expenses, and with energetic management may considerably increase its product.

The Cashier has never paid any thing, and is in ore too poor to pay expenses.

Cleveland has never paid below the surface—it is not worked at present.

Gold Placer.—This company is making efforts to buy Ballou's interest, $\frac{8}{15}$ths, in the best property the company claims. The company is going to build a long flume to Cache Creek. It is the opinion of gentlemen having knowledge of such matters that the holders of this stock, who purchased on the representations of the company's prospectus, can recover their money on the ground of false statements made in that document.

The Seaton.—There is a judgment lien on this mine for work done, and though the amount is not large, it should be considered by those proposing to invest in this stock.

The N. Y. and Colo. is said to be a valuable property, and worth all the stock is selling for to-day.

Moose.—It is reported that the control of this company has been purchased at $200,000—$50,000 cash down, balance in June and July. The management is to be changed in June, Mr. Gill going out. We hear the men have recently been paid their March wages. Our remarks of some weeks ago with regard to this company were fully justified, but as the mine is really a valuable one, under better management it may come to be worthy the attention of investors, at, however, a great decline from recent prices.

La Crosse.—A tunnel location is not expected, even by the owners, to pay dividends for a long time to come. The company is clearing out its shaft on the Burroughs and is taking out some ore from it, but whether paying ore or sufficient in quantity, if the quality is satisfactory, are still open questions.

Grand Belcher.—Only a tunnel—never produced any thing, in fact no good pay ore has ever been found on the mountain into which the tunnel runs.

There are plenty of good mines, such as the Bobtail, Briggs, Boulder Nest, Dunderburg, Terrible, Melvina, Gregory, Gunnell, Iron, Carbonate, etc., and it is much to be regretted that so rich a country should be represented on the New York Stock Board for the most part by mines either worthless or grossly overvalued. This is doing Colorado an injustice and an injury from which it will long continue to feel the ill effects.

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY	CLOSING QUOTATIONS						Opening May 31.
	May 24.	May 25.	May 27.	May 28.	May 29.	May 30.	
Alpha	11¼	10⅜	9⅞	10⅜	10¾	.....	10½
Belcher	2¾	2¾	2¾	2⅝	2⅝	.....	2½
Best & Bel.	12¾	12¾	13	13⅛	13⅜	.....	14
Bullion	4¼	4	4	3⅞	4	.....	.....
Caledonia	1⅞	2	1⅞	1¾	1⅞	.....	.....
California	17⅞	17¾	19⅝	20	20	.....	20
Challar-Pot	24½	.....	24¼	25½	26½	.....	27
Con. Imp	.....	.....	.....	.....	.....	.....	.....
Con. Va	13	13	13⅜	13⅛	13⅛	.....	13⅛
Confidence	3¾	.....	.....	4⅛	4	.....	.....
Crown P'int	4	4	3⅞	3⅞	4	.....	3⅛
Eureka Con	57⅛	57¾	57	56¾	54	.....	55
Exchequer	2¾	2⅛	2⅝	2⅛	2⅝	.....	.....
Gould &Cur	6¼	6⅛	6⅛	6⅜	6¼	.....	7
Grand Prize	3¼	3¼	3⅛	3⅜	3¼	.....	.....
Hale & Nor.	5¾	5⅞	5¾	6	6⅝	.....	7½
Julia	7⅛	7⅜	7⅜	7¾	7⅞	.....	.....
Justice	4	4	4	4⅛	4	.....	4
Kentuck	3	2¾	.....	.....	.....	.....	.....
Mexican	9	8⅞	9⅛	9⅜	9⅞	.....	10
North. Belle	8½	8½	7¾	7⅛	7	.....	.....
Ophir	34	34	34½	38¼	36¾	.....	38
Overman	8½	8⅜	11	11½	12	.....	12
Ray. & Ely	4	.....	3⅞	3¾	4	.....	3¾
Silver Hill	1⅝	1½	1⅝	1½	1½	.....	.....
Savage	9⅛	9⅞	9¼	9½	10⅞	.....	12½
Seg. Belcher	.....	.....	.....	.....	.....	.....	.....
Sierra Nev.	4½	4¼	4	4¼	4⅛	.....	4
Union Con.	4¼	4⅝	4¾	5	4⅞	.....	5
Yel. Jacket	7⅞	.....	8	8⅜	8½	.....	8½

The quotations of the San Francisco stocks continue to slightly improve, especially in the Bonanzas. California has advanced to $20 per share, against $17⅛ a week ago. Consolidated Virginia also shows a slight improvement. The work of repairing the shaft of this mine is making very satisfactory progress, the average rate being 15 feet per day. With reference to the suit recently brought against the Bonanza firm, the San Francisco *Bulletin* of the 25th inst. publishes a statement from the firm of Flood & O'Brien, three columns in length, giving their version of the causes which have led to the bringing of the suit, as well as statements criticising their management which have appeared from time to time in print or have been circulated on the street. It is the first reply ever publicly made by the firm to the accusations against them. The statement is made in view of the doubt said to be entertained as to whether the suit will ever be brought to trial to afford an opportunity of disproving the allegations in the complaint. Meantime Dewey, supposed to be in the interest of the plaintiffs, has gotten up a pamphlet, attacking the Bonanza firm, to be mailed to Eastern stockholders. The details of claims which it is alleged were wrongfully appropriated by the defendants is given in the following statement:

By profits on milling	$3,285,270
By misappropriation of slimes and tailings	20,000,000
By illegal dealing in mining ground	10,469,068
By profits on wood and lumber	1,000,000
By profits on supply of water	20,000
By dealings with Nevada Bank	700,000
By commissions on purchase of supplies	200,000
Total	$35,634,338

In addition will be asked interest at the rate of ten per cent per annum, compounded half-yearly, which will bring the amount up to about $45,000,000. On this last sum the interest for one month will amount to $375,000. It is intimated that a similar suit will be commenced in the United States Circuit Court on behalf of the California Mining Company for about $15,000,000, so that the points at issue may be passed upon by both State and Federal authority.

Hale and Norcross shows a decided advance, opening to-day at $7½ per share against 5¾ a week ago. Ophir is also up to $38, an advance of $4 for the week. Eureka Consolidated is still declining, opening at $55, against 57½ last week.

The *Commercial Herald* of the 23d inst, says of the market:

"A somewhat better feeling manifested itself in the mining stock market during the week under review, an increased aggregate business being the result. Julia was the feature of the market, and large blocks of stock were disposed of at a very smart advance—from $4.50 to $7.87½—naturally producing a speculative feeling that extended in a slight degree to some of the other shares. In and around the 'bonanzas' nothing of importance has taken place, prices of these stocks not holding their own at the close. In the locations on either side of these claims a slight improvement in the market rate of the shares has taken place."

Assessments, with dates when delinquent: Eldorado State, 30c., June 20; Signal Silver, 50c., June 17; Navajo, 25c., June 24; William Penn, 2c., June 17; Caledonia, 50c., June 24.

The Eureka Cons. Mining Co. has declared a dividend of $3 per share.

MINING ASSESSMENTS.

The following is a list of mining assessments delinquent in May from the San Francisco *Stock Report* of the 23d inst.:

Name of Company.	Amount per share.	Total. amount.	Date when delinquent.
Andes	$0.25	$25,000	7
Best & Belcher	1.00	100,800	21
Bella Union Quicksilver	10	5,000	23
Caledonia Gravel	4	4,000	18
California Gold	10	3,000	14
Confidence Gold	20	4,000	23
Champion	20	20,000	13
Colorado River	25	25,000	21
Confidence	50	12,480	15
Consolidated Imperial	20	100,000	15
Day	30	30,000	17
Dayton	25	25,000	7
De Frees Mill	15	15,000	27
Deer Creek	50	6,000	6
Diana	5	5,000	30
Danube	5	5,000	22
El Dorado South	50	20,000	31
Enterprise Consolidated	20	5,400	17
Equitable Tunnel	10	4,000	8
Excelsior	25	25,000	23
Green	50	10,000	25
Gould & Curry	1.00	108,000	22
Hamburg	50	50,000	25
Homestake	1.00	100,000	10
Indian Queen	10	6,000	28
Justice	1.50	157,500	4
Kearsage Mill	50	10,000	18
Leopard	30	15,000	13
Low-Range Ledge	2	2,000	4
Minnetta Belle	50	50,000	6
Monitor Belmont	50	25,000	27
New York Hill	20	6,000	2
North Con. Virginia	50	50,000	18
Overman	3.00	115,200	31
Pleiades	5	5,000	25
Raymond & Ely	1.00	30,000	20
Rock Creek	10	10,000	31
Savage	1.00	112,000	7
Silver Hill	1.00	108,000	10
South Barcelona	20	12,000	20
Tuscarora Consolidated	10	10,000	4
Union Consolidated	25	25,000	14
Wells Fargo	10	10,800	3
Yellow Jacket	2.00	240,000	8
Young America	15	9,000	15
Total		$1,716,180	

NEW CORPORATIONS.

We note the recent organization of the following companies in addition to those announced in our issue of April 27th:

Ajo Copper Mining Co.	Arizona	
Globe City Cons. Mill and Mg. Co.	"	10,000,000
Hassayampa Hydraulic Mg. Co.	"	5,000,000
Maybean Mining Co.	"	2,500,000
Oriental Mining Co.	"	2,500,000
Pactolus Placer Mining Co.	"	10,000,000
Tiger Mining Co.	"	10,000,000
Willard Ruby Mining Co.	"	10,000,000
Big Flag Gold Mining Co.	California.	10,000,000
Cocos Islands Mineral and Mg. Co.	"	3,000,000
Gold Hunter Cons. Mining Co.	"	1,000,000
Hudson Gold Mining Co.	"	500,000
Lucky Baldwin Mining Co.	"	50,000
Maryland Mining Co.	"	1,000,000
Michigan Bluffs Gravel Mg. Co.	"	10,000,000
*Pacific Coast Soap Co.	"	200,000
Richer Mining Co.	"	5,000,000
Treasure Mining Co.	"	10,000,000
Akron Mining Co.	Colorado.	100,000
Lake County Mining Co.	"	25,000
La Veta Mining Co.	"	20,000
Ni Wot Reservoir & Irrigating Co.	"	1,100
Palmerston Ditch Co.	"	1,500
Swan River Placer Irrigating Co.	"	100,000
Albion Mining Co.	Nevada.	10,000,000
Dreadnot Consolidated Mining Co.	"	10,000,000
Forest City Cons. Gold Mining Co.	"	1,000,000
Pearl Gold and Silver Mining Co.	"	10,000,000
Sunrise Cons. Mining Co.	"	10,000,000
Weston & Drew Mining Co.	"	10,000,000
Willard Ruby Silver Mining Co.	"	10,000,000
Addie Gold and Silver Mining Co.	Dakota Ter.	10,000,000
Bear Butte Cons. Mining Co.	"	10,000,000
St. George Gold Mining Co.	Idaho.	2,000,000
Toronto Coal Co. of Cape Breton.	P. E. I.	200,000

* Incorporated to manufacture soap from mineral substances.

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

COAL STOCKS.

NAME AND LOCATION OF COMPANY.		Feet on Vein.	Capital Stock.	SHARES. No.	SHARES. Par Val.	ASSESSMENTS. Total levi'd to date.	ASSESSMENTS. Date and amount per share of last. Mo.	Yr.	Amt.	DIVIDENDS. Total paid to date.	Last Dividend. Mo.	Yr.	Amt.	Rate per Ann.	HIGHEST AND LOWEST PRICES PER SHARE IN CURRENCY AT WHICH SALES WERE MADE. N. B.—Quotations of D., L. & W. R. R., and Pa. Coal Co. are per $100—two shares. May 25. H.	May 25. L.	May 27. H.	May 27. L.	May 28. H.	May 28. L.	May 29. H.	May 29. L.	May 30. H.	May 30. L.	May 31. H.	May 31. L.	SALES.
			$		$					$				Per c'nt													
Consol. Coal	Md.		10,250,000	102,500	$100	*					Jan.	1877	2½														
Del. & H. Canal	Pa.		20,000,000	200,000	100	*				34,821,104	Aug.	1876	4	9	55⅝	55	55⅝	55¼	56⅛	55⅛	56¼	55⅞			56¼	55¾	7,010
Del., Lac. & W. R. R.	Pa.		26,200,000	524,000	250	*					July	1876	2½	5	55⅛	54⅝	55⅞	55	56⅜	55¼	56⅜	56			56⅝	56	91,610
Lehigh C. & Nav.	Pa.		10,448,550	208,971	50	*					Nov.	1876	1½	5¼	17⅛	17	17⅛	16⅝	16⅜	16	16⅞	16¼			17	16¼	5,487
Lehigh Valley R. R.	Pa.		27,042,900	540,858	50	*									37	36⅞	37¼	37⅛	37¼	37	37⅛	37			37⅜	37¼	1,900
Maryland Coal	Md.		4,400,000	44,000	100	*					Jan.	1876	1½														
N. J. Central R. R.	Pa.		20,600,000	206,000	100	*					Apr.	1876	2½	2½	22½	21	22¼	22	23⅜	22¼	24	23½			26⅛	25	14,412
Pennsylvania Coal	Pa.		5,000,000	100,000	50	*					Feb.	1878	3		155												25
Pennsylvania R. R.	Pa.		68,870,200	1,337,404	50	*					May.	1877	1½	8	29¼	29	29⅝	29	29⅛	28⅞	29⅝	28⅞			29⅞	29⅜	94,021
Phil. & Read. R. R.	Pa.		34,278,175	685,563	50	*				43,012,497	Jan.	1876	2½+	10	14	13⅞	14⅜	14	14	13⅝	14⅞	14			15⅜	15⅛	18,936

GENERAL MINING STOCKS.

Dividend Paying Mines.

American	Col.		1,000,000	100,000	10	*				50,000	May.	1878	$0	10	12	7		7¼				6¾				6½	6	1,400
Belcher, g. s.	Nev.	1,040	10,400,000	104,000	100	1,280,400	Mar.	1878	1 00	15,397,200	Apr.	1876	1	00	12													
Bobtail, g.	Col.	2,500	1,130,630	227,320	5	*				56,831	Nov.	1877			25													
Bobtail Tunnel, g.	Col.		100,000	20,000	5	52,000	July	1873	0 30	40,000	Dec.	1877			50	20												
California, g. s.	Nev.	600	54,000,000	540,000	100					24,840,000	Mar.	1878	2	00	24	19	18¼	19		20⅜	20	21	20			20¾		120
Calumet & Hecla, c.	Mch		2,000,000	80,000	25	1,000,000				12,650,000	Feb.	1878	5	00	20													
Central, c.	Mch		500,000	20,000	25	100,000	June	1862	0 65	1,260,000	Feb.	1878	5	00														
Chollar Potosi, g. s.	Nev.	1,400	2,800,000	28,000	100	1,578,000	Jan.	1878	3 00	3,060,000	Feb.	1872	1	00														
Copper Falls, c.	Mch		1,000,000	20,000	50	535,000	May.	1876		100,000	Nov.	1871	1	00														
Cons. Virginia, g. s.	Nev.	710	54,000,000	540,000	100	474,600	June	1873	3 00	38,880,000	Mar.	1878	2	00	24			13⅜				14¾				14¾		125
Confidence, g. s.	Nev.	130	2,496,000	24,960	100	248,832	Apr.	1878	0 20	78,000	May.	1865	8⅓		8⅓													
Cons. Her. & Roe	Col.	16,500	1,000,000	100,000	10	*				120,000																		
Crown Point, g. s.	Nev.	600	10,000,000	100,000	100	1,673,370	Jan.	1878	1 00	11,588,000	Jan.	1875	2	00	24													
Eureka Cons., g. s. L.	Nev.		5,000,000	50,000	100	100,000	May	1876	1 00	1,600,000	Feb.	1878	3	00	24													
Eureka G. Mg., g.	Cal.	1,680	2,000,000	20,000	100					2,134,000	Aug.	1877	2	00														
Franklin, c.	Mch		500,000	20,000	25	360,000	June	1876	5 00	585,000	Nov.	1871	1	00														
Gould & Curry, g. s.	Nev.	612	10,800,000	108,000	100	2,666,000	Apr.	1878	1 00	3,826,800	Oct.	1870	10	00														
Grand Prize	Nev.									1,200,000	Feb.	1878	1	00														
Hale & Norcross, g. s.	Nev.	400	11,200,000	112,000	100	2,746,000	Dec.	1877	1 00	1,598,000	Apr.	1871	5	00	12													
Hukill, g. s.	Col.	3,288	1,000,000	100,000	10	*				180,000	May.	1878	3	10	12			4.60		4.65		4.60						950
Kentuck, g. s.	Nev.	95	3,000,000	30,000	100	270,000	Dec.	1874	1 00	1,252,000	Mar.	1870	5	00														
Leopard, L. g. s.	Nev.	1,500	5,000,000	50,000	100	125,000	Feb.	1878	50	162,500	Dec.	1876	0	50														
Merrimac, s.	Mas.	1,500	500,000	100,000	5	*				120,000	Mar.	1878	0	10	12													
Minesota, c.	Mch.		1,000,000	20,000	50	436,000	June	1869	1 00	1,820,000	Mar.	1876	0	50														
Moose	Col.	39,000	2,000,000	200,000	10	*				200,000	Mar.	1878	0	25	10					4								100
National, c.	Mch.		500,000	20,000	25	195,000	Oct.	1875	1 00	360,000	Oct.	1873	1	00														
N. Y. & Colorado, g.	Col.		1,000,000	50,000	20	*				20,000	Mar.	1877	0	20								1.95	1.90					200
Northern Belle, s.	Nev.	1,800	5,000,000	50,000	100					1,425,000	Feb.	1878	1	00														
Ontario.	Uth.	3,000	10,000,000	100,000	100					1,300,000	May	1878	1	00	6	36⅜		36⅛	36	36⅛		36⅛				36⅛	36	665
Ophir, g. s.	Nev.	675	10,080,000	100,800	100	3,136,000	Mar.	1878	1 00	1,394,400	Mar.	1864	4	00														
Pewabic, c.	Mich.		500,000	20,000	25	185,000	June	1868	3 00	460,000	July	1873	1	00														
Phœnix, c.	Mch.		1,000,000	20,000	50	817,500	Sept.	1870	3 00	20,000	Jan.	1876	1	00														
Plumas	Cal.		1,000,000	100,000	10					26,000	May	1878			10	4.15	4.05	4.20	4.10	4.20	4.10	4.25	4.15			4.20	4.15	8,035
Polar Star, g. s.	Col.	1,300	500,000	50,000	10	*				5,000	Jan.	1878	0	10														
Quincy, c.	Mich.		200,000	20,000	10					2,130,000	Feb.	1877	4	00														
Raymond & Ely, g. s.	Nev.	5,000	3,000,000	30,000	100	540,000	Dec.	1876	1 00	3,075,000	Sept.	1873	3	00														
Ridge, c.	Mich.		500,000	20,000	25	200,000				90,000	Feb.	1875	1	00														
Rye Patch	Nev.	3,000				97,500	Nov.	1876	0 50	150,000	Dec.	1877	0	25														
St. Joseph, L.	Mo.	2,000 acs.	1,000,000	100,000	10					250,000																		
Savage, g. s.	Nev.	800	11,200,000	112,000	100	3,762,500	Apr.	1878	1 00	4,460,000	June	1869	3	00														
Seaton, g. s.	Col.	1,700	500,000	50,000	10	*				10,000	May	1877	0	10	12													
Sierra Nevada, g. s.	Nev.	3,650	10,000,000	100,000	100	1,050,000	Jan.	1878	0 50	102,000	Jan.	1871	1	00	10													
Silver King										200,000	Feb.	1878	0	50														
Standard	Cal.									300,000	Feb.	1878	1	00														
Yellow Jacket, g. s.	Nev.	1,200	12,000,000	120,000	100	3,678,000	Apr.	1878	2 00	2,184,000	Aug.	1871	2	50														

Non-Dividend Mines.

Allouez, c.	Mch.		1,000,000	20,000	50	940,000	May	1876	5 00																		
Alpha, g. s.	Nev.	300	3,000,000	3,000	100	213,000	Mar.	1878	1 00																		
Am. Flag, g.	Col.	5,300	600,000	60,000	10	*																					800
Bertha & Edith, g.	Vir.	645 acs.	3,500,000	350,000	10	*																					
Best & Belcher, g. s.	Nev.	545	10,080,000	100,800	100	438,592	Apr.	1878	1 00							9c	7c	9c	6c	6c	5c	10c	5c			7c	6c.	108,900
Buckeye	Col.		5,000,000	500,000	10	*										38c	37c	37c				37c						2,700
Bullion, g. s.	Nev.	943⅛	10,000,000	100,000	100	2,802,000	Jan.	1878	1 00																		
Caledonia, g. s.	Nev.	2,188	10,000,000	100,000	100	1,485,000	Feb	1878	0 50																		
Cashier	Col.		500,000	250,000	2	*																					
Cleveland, g.	Col.	3,715	250,000	25,000	10	*																					
Cons. Imperial, g. s.	Nev.	468	50,000,000	500,000	100	675,000	Apr.	1878	0 20																		
Con. N. Slope & E. C. T.	Col.	15,000	500,000	10,000	50	*																					
Dahlonega	Ga.		250,000	250,000	1	*										17c		18c	17c	18c	17c	20c	19c			20c	18c.	27,700
Dana, c.	Mch.		500,000	20,000	25	68,000	Jan.	1863	0 50																		
Dawson, s.	Ont.		1,200,000	60,000	20																						
Duncan, s.	Ont.		1,200,000	60,000	20	75,000	July	1876	4½																		
Exchequer, g. s.	Nev.	400	10,000,000	100,000	100	380,000	Jan.	1878	1 00																		
Gold Placer, g.	Col.		5,000,000	200,000	25											1.10	1.05			1		1.05	97c				1,100
Granville, g.	N. C.	9,000	1,000,000	100,000	10	*																					
Humboldt, c.	Mch.		500,000	20,000	25	100,000	Sept	1876	0 50																		
International, s.	Ont.		1,200,000	60,000	20				0 15																		
Julia, g. s.	Nev.	3,000	11,000,000	110,000	100	525,000	Jan.	1878	0 75																		
Justice, g. s.	Nev.	2,100	10,500,000	105,000	100	2,394,500	Mar.	1878	1 50																		
King's Mountain, g.	N. C.		1,200,000	120,000	10	*																					
Lacrosse	Col.	3,900	1,000,000	100,000	10	*												1.60		1.80						1.60		500
Luzerne	Col.	4,200	5,000,000	100,000	10	*										36c	33	34c	31c	36c	33c	37c	35c			37c	34c.	80,200
Madison, c.	Mch.		500,000	20,000	25	123,000	Sept	1876	0 10																		
Mariposa preferred	Cal.	44,387	5,000,000	50,000	100	1,425,000	June	1877	1 00																		
" common	Cal.	acres.	10,000,000	100,000	100	1,425,000	June	1877	1 00							1½											50
Memphis	Col.	6,000	300,000	60,000	5	*																					
Mesnard, c.	Mch.		500,000	20,000	25	160,000	Apr.	1876	0 50																		
Mexican, g. s.	Nev.	600	10,080,000	100,800	100	181,440	Aug.	1877	0 30																		
Mt. Bross Tunnel	Col.	8,600	2,000,000	200,000	10	*																1.10					300
Overman, g. s.	Mch.		1,000,000	40,000	25	3,173,880	Apr.	1878	3 00																		
Osceola, c.	Nev.	1,200	3,840,000	38,400	100	2,567,880	Nov.	1877	3 00																		
Petherick, c.	Mch.		500,000	20,000	25	165,533	Mar.	1876	0 50																		
Pleasant View, g.	Col.	1,200	200,000	20,000	10	*																					
Quicksilver preferred	Cal.	8,500	4,291,300			*																					
" common	Cal.	acres.	5,708,700	100,000	100																						
Rockland, c.	Mch		500,000	20,000	25	495,000	Jan.	1874	1 00									16½				16¼				16		200
Seg. Belcher, g. s.	Nev.	100	640,000	6,400	100	244,800	Apr.	1876	5 00																			300
Silver City, g. s.	Nev.	3,900	6,340,000	63,100	100	15,775	Nov.	1875	0 25																		
Silver Hill, g. s.	Nev.	5,400	5,400,000	54,000	100	192,600	Dec.	1877	1 00																		
Star, c.	Mch.		500,000	20,000	25	265,000	Mar.	1876	0 50																		
Superior, c.	Mch.		500,000	20,000	25	340,000	Mar.	1874	0 25																		
Union Cons. g. s.	Nev.	850	10,000,000	100,000	100	310,000	Apr.	1878	0 25																		

g. Gold. s. Silver. L. Lead. c. Copper. * Non-Assessable.

Total Assessment levied to date..... 52,057,802 | Total Sales of Coal Stocks for the week..... 233,500 shares.
Total Mining Dividends to date..... 220,477,832 | Total Sales of Mining Shares for the week..... 234,315 "

+ A dividend of 3½ per cent. was declared on the preferred stock of this Co. in July.